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IRRIGATED AGRICULTURE
WATER QUALITY MANAGEMENT PLAN

Section 208, P.L. 95-217

January 1979

Water Quality Planning
Office of Water Programs
Department of Ecology
Olympia, Washington

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IRRIGATED AGRICULTURE WATER QUALITY MANAGEMENT PLAN

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PROBLEM STATEMENT

Each year, excess irrigation water removes significant quantities of soil from irrigated farmland. Irrigation return flows carry soil resources and a variety of agricultural chemicals to rivers and streams draining agricultural areas. The result, is a loss of resources, both for the farmer and the general public. Not only are soil, nutrients, and chemicals lost from the land but receiving water quality may be degraded as well.

The solution to the problem of irrigated agriculture pollution abatement is complex. Farming communities are generally composed of individually owned or operated farm units, each with its own unique topography and soils. In addition, irrigation farmers are dependent upon some type of delivery and drainage system to provide adequate water at the proper times to meet crop needs and to drain soils and remove excess runoff.

A farmer's economic situation depends not only on his own management, but on the particular market system through which his product passes. Consequently, any successful approach to pollution control in irrigated agriculture must consider the independent and unique nature of each farm, the social and economic systems in which the farmer operates, his attitudes concerning the nature of the problem, and the overlapping and interdependence of water delivery and return flow systems.

Irrigation farmers have recently come under another operational consideration--the mandates of the federal Clean Water Act (P.L. 95-217). Along with the job of obtaining adequate water to meet crops needs, the farmer now must also consider the quality of water which leaves his land. Traditionally, water has been relatively inexpensive compared to other production costs, such as machinery, fertilizer, seed, etc. Consequently, optimum water management has not often been a primary management consideration.

A program to control irrigation return flow water quality problems must meet the requirements of federal law and still reflect the constraints and systems under which the irrigation farmer operates.

SECTION I

SUMMARY

Introduction

In September 1976, the Department of Ecology (DOE) formally began a two-year planning process to seek solutions for irrigation return flow pollution abatement. The planning process was initiated as part of a nationwide federal and state effort to clean up the nation's waters required by the 1972 Federal Water Pollution Control Act amendments. The 1972 Act set water quality goals and established provisions for controlling or eliminating water pollution, wherever attainable, by 1985.

Congress gave the Environmental Protection Agency (EPA) the authority for implementing the Act, but reserved for the states the primary responsibility for planning local solutions for local water pollution problems. One of the unique aspects of this law is the degree of decision-making control reserved at the local level.

Section 208 of the Act requires each state to develop an areawide water quality management program to control both point and nonpoint sources of pollution. The planning process for designing and adopting the 208 plans was to be completed by November 1, 1978.

As part of their 208 programs, many states, including Washington, have identified agricultural activities as a major source of water quality problems. The Department of Ecology is serving as the planning agency for Washington's irrigated agriculture 208 program, and as such, must identify needs and programs to control pollutants in irrigation return flows.

Planning Approach

In the fall of 1976, DOE published a detailed workplan outlining objectives and tasks to be completed during the two-year 208 planning process. Tasks were divided into the four areas of Program Management, Public Awareness, Best Management Practices, and Implementation. Also included in the workplan was a schedule of outputs, manpower needs, budget, and commitments of involved agencies.

The planning program was designed to meet the following objectives:

1. Continue assessment of water quality problems and pollution sources,
2. Promote public awareness,
3. Involve the farming community,
4. Define Best Management Practices (BMP),
5. Recommend incentive and institutional alternatives, and
6. Draft an implementable program that will improve water quality.

Prior to beginning 208 planning in September 1976, DOE staff conducted an initial nonpoint source assessment. The result of that effort was a

decision to concentrate on the most intensively irrigated lands in six counties of central Washington, three in the Columbia Basin, and three in the Yakima Basin. Solutions obtained from planning efforts in these counties would, it was believed, be applicable to other irrigated areas of the state where similar problems might occur.

After a review of water quality data during the assessment, DOE staff decided to direct initial 208 planning efforts only toward the control of sediment. While the department recognized that sediment is not the only water quality parameter of concern in irrigated areas, it was believed that its control would provide the greatest improvement in receiving water quality. As discussed in the management plan, control of sediment might also provide control of other sediment-related parameters such as phosphate and pesticides. Implementation of BMP may also reduce the movement of nitrates and salts to receiving waters.

Although 208 planning efforts initially began in six counties, the final plan only addresses five. Planning efforts ended in Kittitas County in May 1978 based on a reevaluation of the nature of water quality problems in the area. Water quality problems in the county are primarily caused by turbidity and would not be solved by the settleable solids control program currently proposed.

The decision to limit 208 planning for irrigated agriculture to five counties made it possible to concentrate manpower, resources, and public participation activities on a smaller target public. Planning procedures outlined in the workplan committed DOE to actively involve both farmers and the general public in developing parts of the 208 plan. Conservation districts were selected to be the primary means of securing local farmer input into 208 planning. Conservation districts are the traditional resource and conservation agencies in rural areas, and it was felt they will have the resources, expertise, organization, and public acceptance to do the job.

DOE signed a contract with the State Conservation Commission to provide assistance for 208 planning in irrigated agriculture areas. The Commission contracted to assist conservation districts in public information activities and provide the services of a technical irrigation specialist to help design BMP. The Commission also had the responsibility to assist in the design and implementation of an information/education program directed at farm organizations and the general farming public.

Public Participation

The underlying concept behind all planning efforts during the two-year development of the water quality management plan was a firm commitment to public participation. Almost half of the workplan budget for the two-year effort was committed to this element.

Public participation activities were directed at three levels: (1) individual farmers, (2) farm organizations and commodity groups, and (3) the general public. Department of Ecology, Conservation Commission, and

Extension Service personnel cooperated in the public participation effort and in the preparation of information/education materials.

Numerous meetings, hearings, workshops, and tours were held throughout the irrigated counties during the two-year planning process. The greatest emphasis was placed on meetings with local farmers within each conservation district. Each district or county formed a water quality committee to develop the 208 plan and recommend how it should be implemented.

Experience in the 208 program has revealed several problems and several advantages inherent to a program heavily dependent on public participation. A major disadvantage is the difficulty of involving people, primarily self-employed farmers who are often too busy to attend meetings. A second disadvantage is the length of time necessary to reach a consensus on a particular point.

DOE's experience in 208 planning, however, is that the advantages of public participation far outweigh the disadvantages. Farmer awareness of the problem and the necessity to develop solutions was greatly increased by this effort. Most importantly, the farmers developed a commitment at the local level to implement the plan and insure its success.

Conclusions

The following list of conclusions has been reached by the Department of Ecology regarding the 208 planning process:

1. The public participation program to involve local farmers in development of the water quality management plan was a worthwhile and successful effort.
2. The majority of irrigation farmers are aware of water quality problems in their area, and are concerned about the quality of their return flows.
3. The majority of farmers involved in 208 planning felt that most people would cooperate voluntarily to correct water quality problems, but regulatory action would be necessary to secure the cooperation of a few.
4. The majority of farmers favored attempting to achieve voluntary cooperation by means of an information/education and incentives program, with regulatory authority used only as a last resort.
5. Most farmers favored a locally controlled program using existing agencies and organizations.

Recommendations

The following list of recommendations represents the major policy decisions made by water quality committees in the public participation process:

1. The local conservation district should be the management agency charged with administering the 208 program.
2. Water quality committees should continue to serve in an advisory capacity to conservation districts, the Department of Ecology, and the Soil Conservation Service regarding implementation of the 208 plan.
3. BMP should be viewed only as farm management guidelines to solve site-specific water quality problems, not as regulations.
4. BMP should be implemented on a site-specific, case-by-case basis to correct individual farm problems.
5. Individual farmers should be given financial and technical assistance through existing federal and state agency programs to enable them to implement BMP.
6. Problem farms should be identified by an objective standard that can be easily understood and quickly measured.
7. Water quality problems are to be confirmed by the action of a local group of farmers familiar with the situation.
8. Only those farms with a confirmed water quality problem should be required to go through the implementation process.
9. Identification of farm units with water quality problems should be through a complaint process rather than by a surveillance program.
10. Regulatory measures to ensure adoption of BMP by problem farmers should be exercised by the Department of Ecology only upon the request of the conservation district.
11. DOE should take a long-term view of the 208 process and allow the voluntary program at least 3-5 years to demonstrate effectiveness.
12. DOE should monitor water quality in the planning areas in order to demonstrate trends in water quality improvement.

SECTION II

WATER QUALITY MANAGEMENT PLAN

PLANNING PROPOSAL

This section of the plan contains the major outputs and recommended actions developed by the water quality committees to resolve water quality problems.

The first part of this section describes the 208 project areas and their existing water resources. The following part outlines a detailed information/education program designed to inform farmers about water quality problems and encourage their cooperation in solving them.

Following the information/education program is a description of the process which will be used to identify problem areas or farms. The fourth element of this section presents a detailed complaint and evaluation process designed to put BMP into place on individual farms. This element, titled Implementation Procedure, is divided into two parts "Local Program" and "Optional Regulatory Program." The local program is administered by the conservation district and is voluntary. Through the local program, farmers can voluntarily seek assistance from the conservation district to design and implement BMP.

The optional regulatory program is administered by the Department of Ecology only at the request of the conservation district and following consultation about actions taken. The majority of farmers felt that most people would cooperate voluntarily if they were aware and informed about the water quality program and the reasons for it. However, in some situations a regulatory backup authority has been provided, if needed, to ensure success of the program.

The planning proposal developed by the water quality committees had the following goal and objectives:

Goal

To implement a locally run program designed to meet the 1983 water quality goals of federal law, wherever attainable, within the 208 project areas.

Specific Objectives

1. Establish an institutional structure, based on conservation districts, to encourage adoption of improved soil and water conservation measures.
2. Encourage the use of more efficient irrigation water management systems.
3. Reduce the transport of sediment from irrigated lands to receiving waters.
4. Implement an information/education program designed to make the farming public more aware of water quality concerns.

5. Encourage reorientation of priorities of federal, state, and local agencies to include water quality improvement.

Plan Jurisdiction

The geographic area covered by the plan includes the 11 conservation districts involved in the planning process. A description of the planning area is presented in the following section.

PLANNING AREA DESCRIPTION

Columbia Basin

The 208 planning area for the Columbia Basin includes all irrigated lands lying within the boundaries of the Franklin, Warden, Othello, Moses Lake, Quincy, and Ephrata conservation districts. The area includes all of the Bureau of Reclamation Columbia Basin Project in Grant, Adams, and Franklin counties, plus other contiguous irrigated lands within the boundaries of the six conservation districts (see Figures 1 and 2).

The western parts of Adams and Franklin counties and all of Grant County lie within an area called the Big Bend Basin, which derives its name from a bend in the Columbia River that borders the area on the southwest, west, and northwest. Three Water Resource Inventory Areas, Esquatzel Coulee (WRIA 36), Lower Crab Creek (WRIA 41), and Grand Coulee (WRIA 42), comprise the western portion of the basin.

Irrigated areas within the basin have an arid to semiarid climate, with rainfall ranging from 7 to 14 inches annually. The first irrigation water within the basin became available in 1948 following construction of Grand Coulee Dam and the water distribution system. Currently, there are about 501,000 acres of irrigated land within the Columbia Basin Project, with an additional 500,000 acres authorized for development following construction of the Second Bacon Siphon and Tunnel. Projected growth is estimated to occur at a rate of 10,000 to 15,000 acres per year. In addition, there are about 75,000 additional acres under irrigation that are not part of the Columbia Basin Project.

The original irrigation project, established in the 1940s, was intended to provide water for furrow irrigation on individual farm units. Recent developments in sprinkler irrigation technology have led to a rapid shift away from furrow irrigation, primarily due to high labor costs. Acreage within the Columbia Basin Project is currently about 56 percent sprinkler irrigated, and 44 percent furrow irrigated. Almost all new land brought into production in the future is expected to be sprinkler irrigated.

A wide variety of crops is grown annually throughout the Columbia Basin. Cereals and other grains were the predominate crop in 1976, comprising about 35 percent of the acreage harvested. Forage crops comprised 34 percent of the acreage, vegetables 12 percent, and seed crops 5 percent,

MAJOR IRRIGATION DISTRICTS WITHIN COLUMBIA BASIN PLANNING AREA.

FIGURE 1

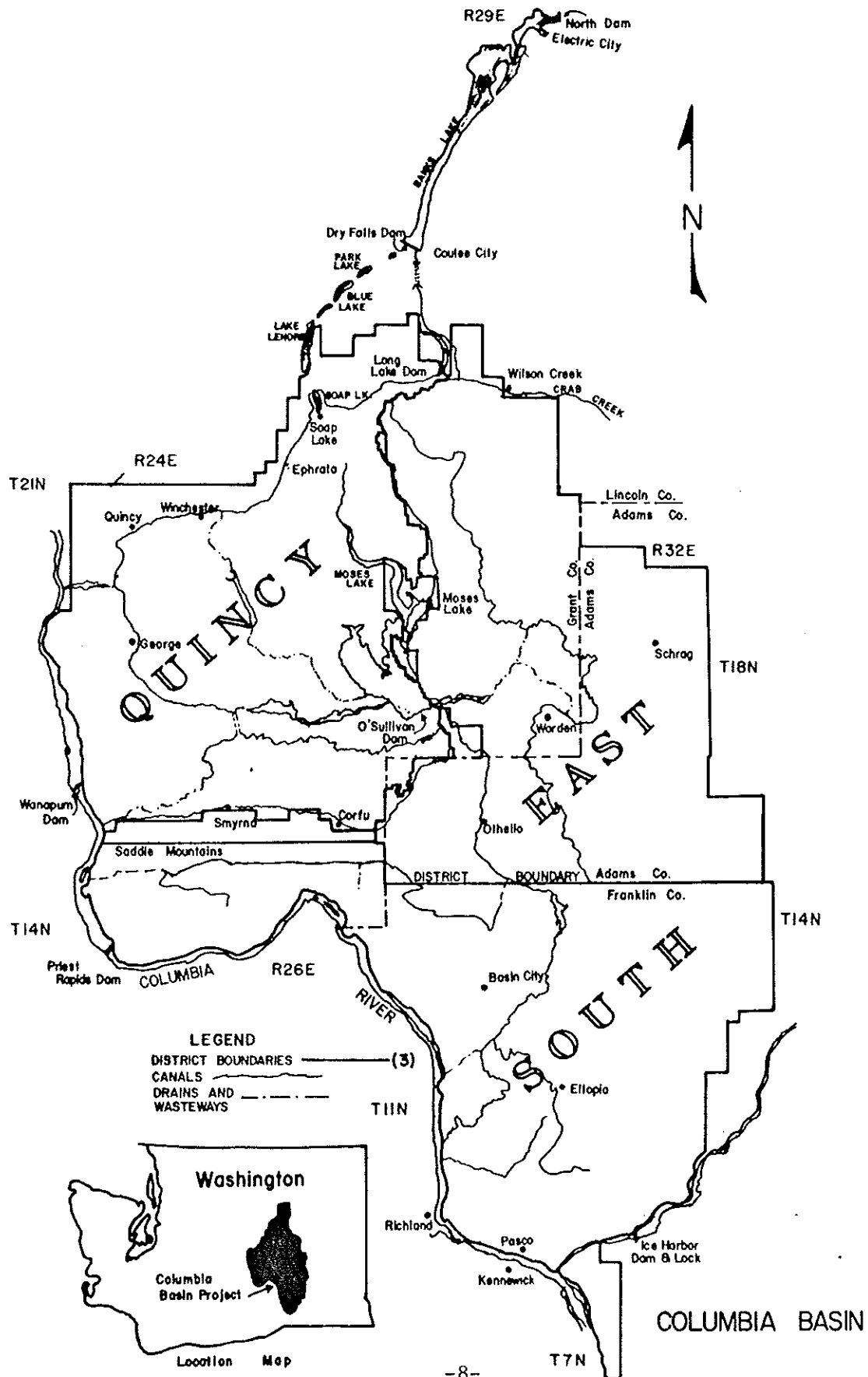
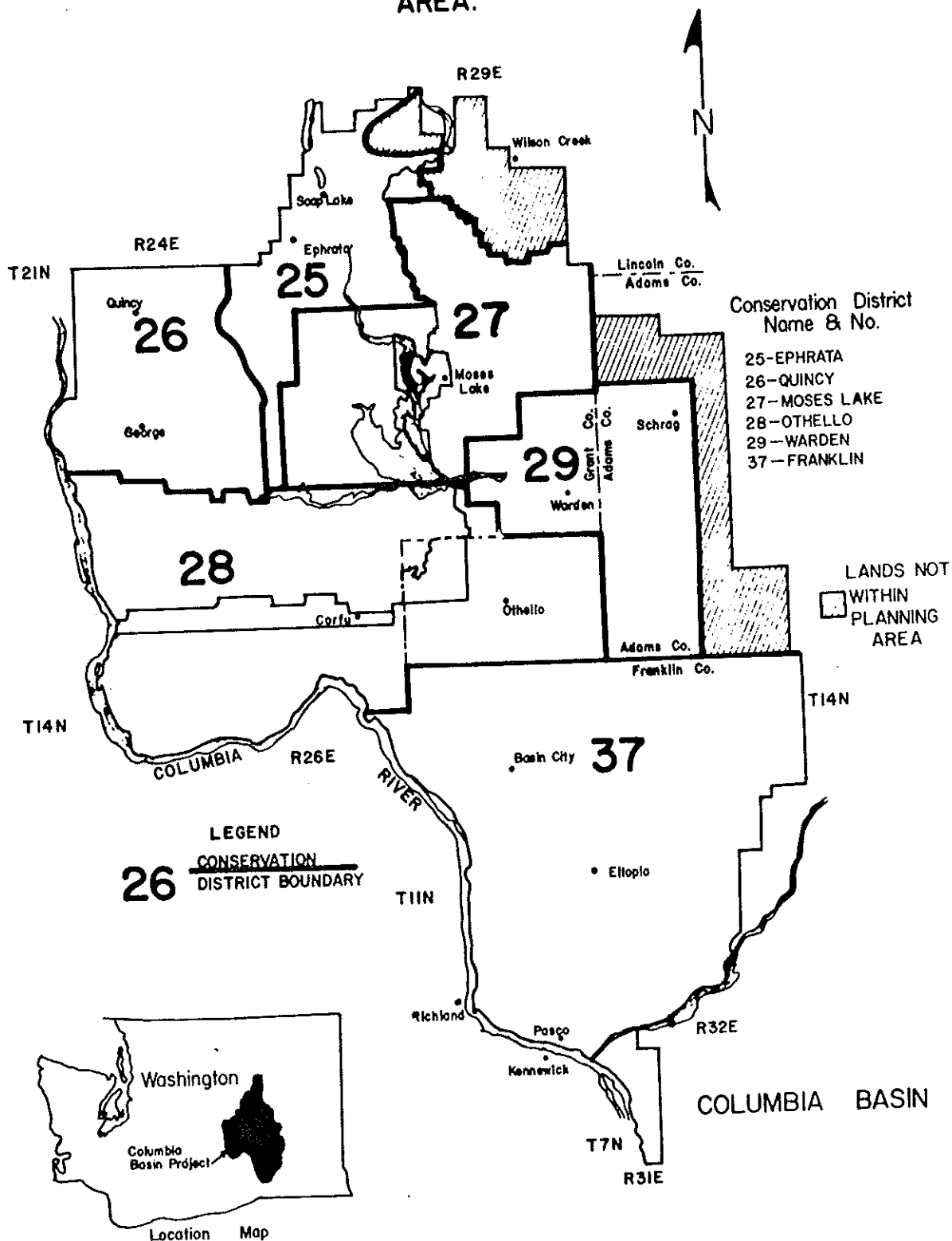


FIGURE 2

CONSERVATION DISTRICTS WITHIN COLUMBIA BASIN PLANNING AREA.



with miscellaneous crops making up the remainder. Acreage of individual crops is highly variable from year to year due to differences in crop prices and rotation schedules.

Approximately 3,000 farm operators farm within the planning area. Average farm size is about 222 acres.

Yakima Basin

The 208 planning area for the Yakima Basin includes all irrigated lands lying within the boundaries of Yakima and Benton counties. The area is comprised of the Ahtanum-Moxee, Benton, Hi-Land, South Yakima, and Wenas Valley conservation districts (see Figures 3 and 4).

Portions of four Water Resource Inventory Areas, Rock Glade (WRIA 31), Lower Yakima (WRIA 37), Naches (WRIA 38), and Upper Yakima (WRIA 39) comprise the Yakima Basin 208 planning area. The irrigated areas in the Yakima Basin have an arid to semiarid climate with rainfall averaging from 6 to 15 inches annually.

Irrigation in the basin began in 1847 on Ahtanum Creek, with the peak in construction of private projects coming in the 1880's. At present there are about fifteen major irrigation districts and numerous smaller districts and ditch companies serving irrigated areas in the basin.

The majority of row and forage crop acres are furrow (or rill) irrigated. Orchard crops have moved steadily to sprinkler systems in the past several years.

Numerous crops are grown in the Yakima Basin, varying in type with climate, price fluctuation, and rotation schedules. Major crops include: (1) orchards (apple, pear, peach, and cherry); (2) grapes; (3) sweet corn; (4) asparagus; (5) alfalfa hay and seed; (6) sugar beets; (7) potatoes; (8) hops; (9) mint; and (10) small grains.

Irrigated land within the Yakima Basin Bureau of Reclamation Project totals about 358,000 acres and is farmed by 13,000 farmers. Average farm size is about 28 acres.

MAJOR IRRIGATION DISTRICTS IN YAKIMA BASIN PLANNING AREA

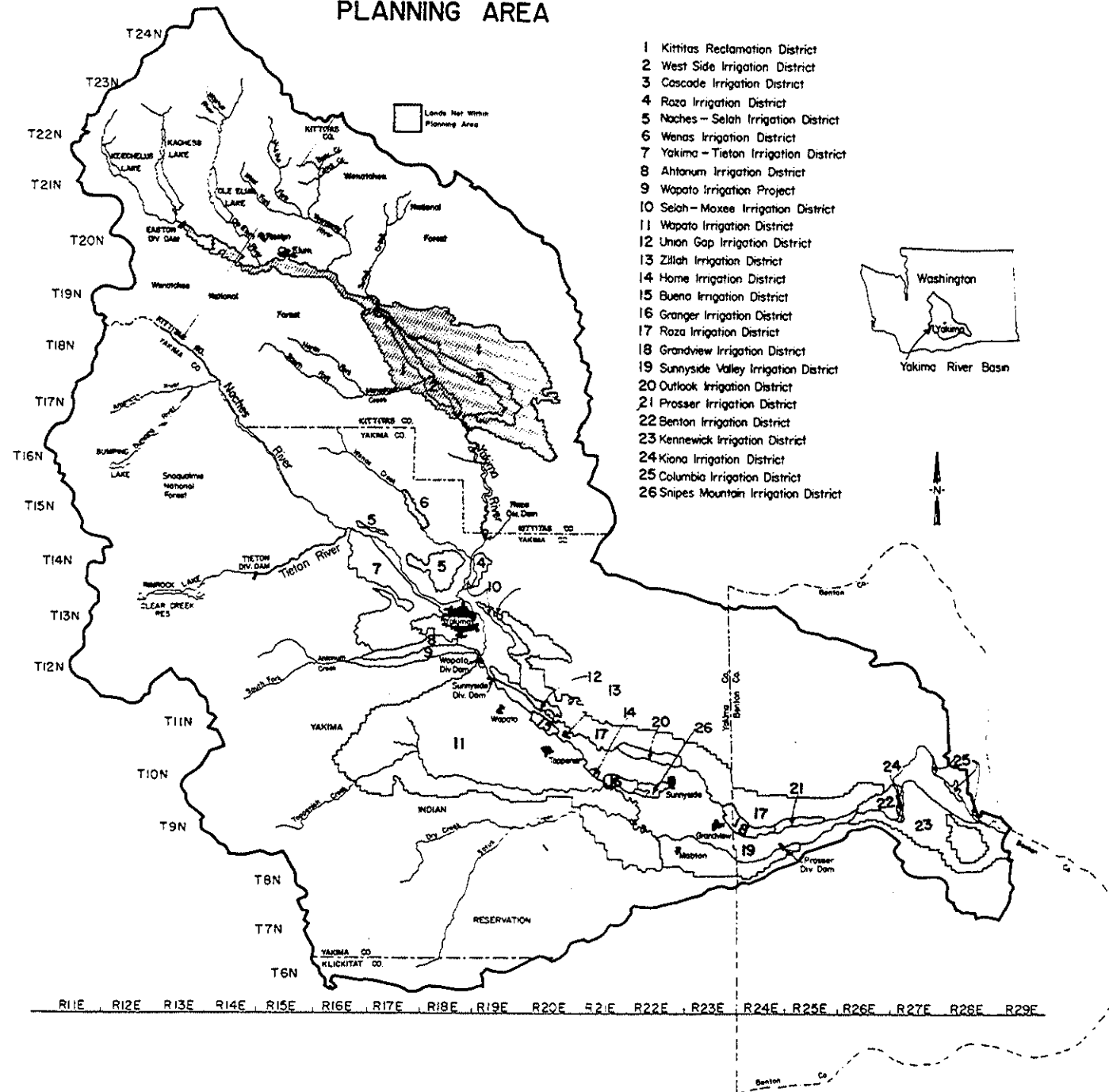
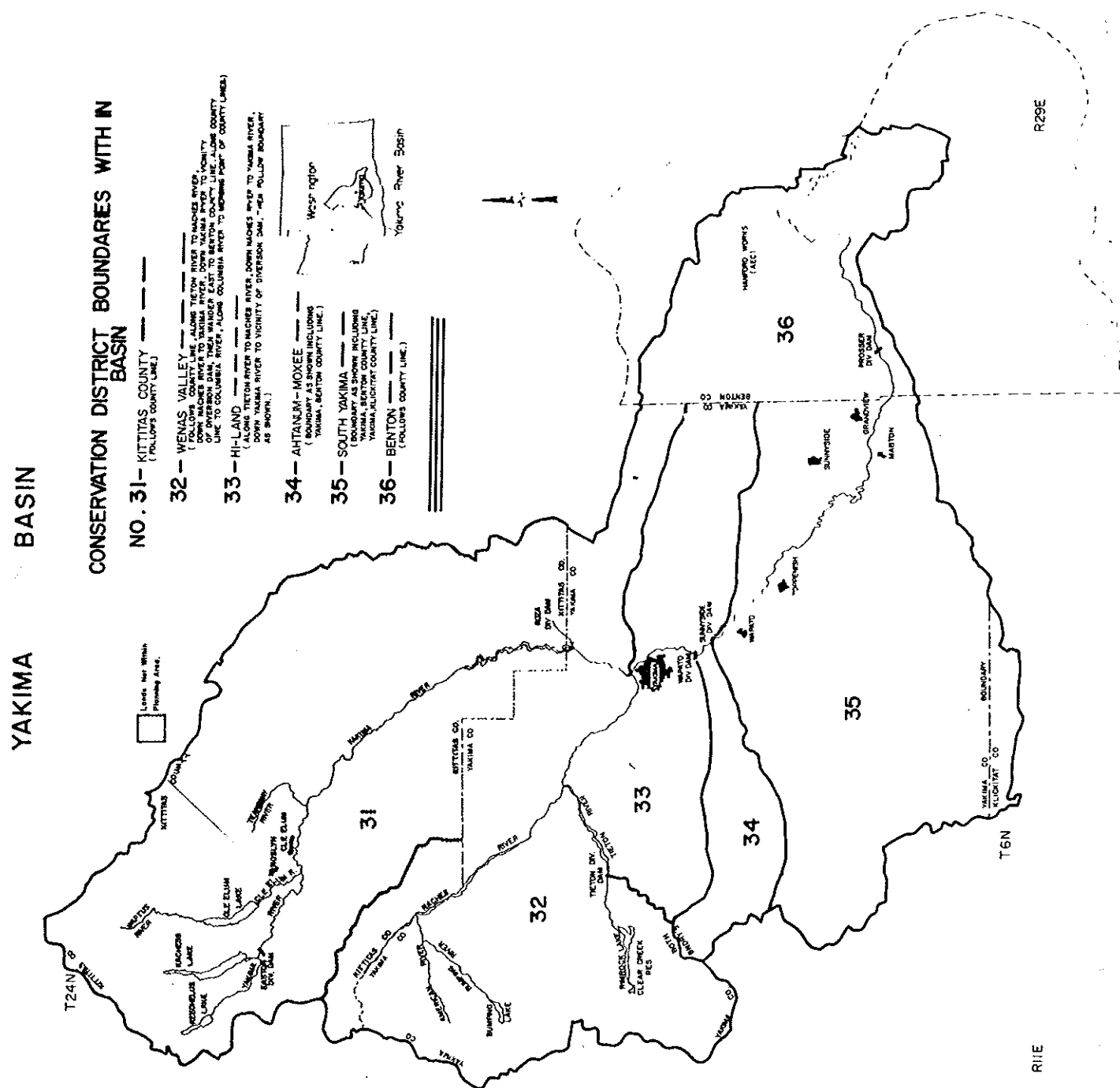


FIGURE 3



Water Resources^{1/}

Columbia Basin

Except for the Columbia River and Crab Creek, few significant natural streams are found within the planning area. Streams of minor importance include Lind Coulee and Esquatzel Coulee. Lakes and impoundments of significance include Moses Lake, Potholes Reservoir, and Scooteney Reservoir, as well as numerous other small pothole lakes filled by seepage water. Irrigation return flows contribute a major portion of the flow to all streams and to Potholes and Scooteney Reservoirs.

State waters are currently assigned a water quality standard based on their present and potential beneficial uses. The section of the Columbia River bordering the planning area is classified as a Class A water and is designated a special study area due to problems with total dissolved gases from the hydroelectric dams. Irrigation return flows currently produce no known violations of water quality standards in the Columbia River.

Major discharges of return flows to the Columbia River occur from three wasteways, Pasco, Esquatzel, and P.E. 16.4, in lower Franklin County. The discharges are composed almost entirely of wastewater that has passed through the upper reaches of the Columbia Basin Project. Water in the wasteways is occasionally quite turbid, but the sediment load contributed to the Columbia River is relatively small.

Monitoring on the three wasteways in the summer of 1977 indicated a contribution of about 15-18 tons per day of suspended sediment. Because of the large volume of the Columbia River compared with that of the wasteways, this sediment contribution represented a loading ratio of 1 percent or less to the Columbia River. The most significant contribution to the Columbia River appeared to be nitrate nitrogen. No water quality standards violations have been attributed to this loading, however.

1/ The data on water resources and water quality problems was taken from the following publications:

- a. The Big Bend Basin Level B Study, prepared by the Washington State Study Team for the Pacific Northwest River Basins. December 1976.
- b. Water Quality Management Plan, Washington Drainage Basins 36, 41, and 42. Prepared by Stevens, Thompson, and Runyan Inc. January 1975.
- c. Agricultural Return Flow Management in the State of Washington, Prepared by CH2M Hill, April 1975.
- d. "Characterization of Present Water Quality Conditions in the Yakima Basin," Department of Ecology, February 1975.
- e. Yakima Cooperative River Basin Study. USDA, June 1978.

Crab Creek is the only other stream in the project area that has been assigned a specific water quality classification. Crab Creek is classified as a Class B water, indicating some impairment of beneficial uses. Possible causes of water quality violations in Crab Creek are attributed to irrigation return flows, pasture drainage, and natural conditions. The water quality standards for pH and fecal coliforms are consistently exceeded along the lower creek. Turbidity levels are also high, but due to the nature of nonpoint sources, a violation of the standards cannot be demonstrated. Water quality in lower Crab Creek does not meet the state water quality goal, and it is unknown whether the goal will be achieved even with the application of BMP. (Department of Ecology Five Year Water Quality Strategy, September 1978.)

Potholes Reservoir, Frenchman Hills Wasteway, Winchester Wasteway, RCD Wasteway, and Moses Lake also commonly exceed the pH standard for Class B waters. Due to the nature of the soils in the area, this condition is presumed due to natural causes. All of the major wasteways, plus natural drainages such as Lind Coulee and Sand Hollow Creek, exhibit high turbidity levels. Insufficient data are available to determine if water quality standards other than pH are being exceeded.

In the Esquatzel Coulee subbasin (WRIA 36), the Potholes Canal above and below Scootenev Reservoir and the East Canal commonly exceed the pH standard for Class B waters. Turbidity levels in Esquatzel Coulee, lower Potholes Canal, and Saddle Mountain Wasteway are consistently high during the irrigation season. Esquatzel Coulee also receives runoff from the dryland farming area in eastern Franklin County. Specific standards have not been assigned to any waters in the subbasin, and no routine monitoring is done in the area.

No surface waters affected by return flows are found in that part of the Grand Coulee subbasin (WRIA 42) lying within the 208 planning area.

Water quality is relatively poor in most surface waters of the basin that receive return flows. A review of existing data by DOE, and an analysis of beneficial uses impacted by poor water quality, revealed that sediment was the primary pollutant of concern.

Other potential pollutants from irrigated agriculture include total coliform bacteria, dissolved salts, nutrients, and pesticides. Except for coliform bacteria, there is no current evidence that these pollutants cause water quality violations. Future planning efforts will continue to examine these parameters and their impacts on beneficial uses within the 208 planning area.

Irrigation water within the basin is distributed primarily through a long series of open canals which deliver water to the head-ditches of individual units. On-farm water application is primarily by furrow irrigation or by sprinkler.

Degradation of water quality can occur anywhere within the distribution, application, and collection system. The primary adverse water quality impacts occur within the application and collection systems. The most noticeable effect on water quality is an increase in turbidity as the

water runs off the lower end of a field. This increase in turbidity is most prevalent in areas of steeper slopes where heavily cultivated row crops are grown under furrow irrigation. Little runoff occurs from application by sprinkler systems, except in isolated cases where the application rate exceeds the soil intake rate.

On-farm practices that affect water quality vary widely, and their impact depends on a variety of structural and management measures. Soil type, steepness of slope, slope length, type of crop, method and amount of tillage, and degree of irrigation efficiency all influence their impact on water quality.

Although turbidity is the most obvious water quality impact, it is highly variable and not always a reliable measure of impaired beneficial uses. The 208 water quality program focused, instead, on the parameter of settleable solids because it is a more direct measure of soil lost from the farm and has an obvious detrimental impact on beneficial uses.

Several additional water quality impacts may be indirectly related to sediment concentration in return flows. Coliform bacteria, phosphate nutrients, and pesticides may move with sediment in return flows. Control of soil erosion may reduce the movement of these pollutants into surface waters.

Movement of nitrate and dissolved salts into surface waters is relatively independent of soil loss. Because of their high solubility, these pollutants can be carried to receiving waters by subsurface flows. Adoption of improved water management techniques as a BMP for erosion control, may result in a reduced loss of nitrates and salts as well.

Yakima Basin

In the Yakima Basin planning area, the main stem of the Yakima River is the primary source of irrigation water. Most of the irrigation districts within the basin are served water from the Yakima Project of the U.S. Bureau of Reclamation. The primary source of this water is six project reservoirs. Less than 5 percent of the agricultural water used in the basin comes from ground water sources. Several perennial and intermittent streams, including the Wilson-Naneum system, Wenas Creek, Naches River, Ahtanum Creek, Toppenish Creek, Satus Creek, Tieton River, and Cowiche Creek also provide water for irrigation.

Major irrigation return flows occur throughout the Yakima system. Some of the major discharges to the Yakima River are Amon Wasteway, Sunnyside Canal Drain, Snipes-Spring Creek, Satus Drain 303, Sulphur Creek, South Drain, Satus Creek, Toppenish Creek, Marion Drain, Granger Drain, Wapato Drain #35, East Toppenish Drain, Ahtanum Creek, Moxee Drain, Naches River, Wenas Creek, and Wilson Creek.

The Yakima River is classified as Class B from its confluence with the Columbia River upstream to the Sunnyside diversion dam. From the dam upstream, the river is Class A throughout the remainder of the planning area.

The major pollutant from irrigation return flows in the Yakima River is sediment. To a lesser degree, phosphate, nitrate, and total coliform bacteria are also added to the river by return flows.

As part of the statewide water quality planning efforts, DOE undertook an evaluation of water quality in the Yakima Basin. This evaluation was to be developed through contracts with CH2M Hill (references previously noted). CH2M Hill conducted its own water quality monitoring and also used existing data to analyze the sources of pollutants entering the Yakima River. The final report attributed degradation of Yakima River water quality primarily to irrigation activities, especially below Sunnyside Dam.

The report states that information "clearly indicated agriculture as a significant source of pollutants," and further, "any attempt to improve the quality of waters in the Yakima Basin must make considerable efforts to improve the quality of (irrigation) return flows." The emphasis on return flows follows the estimate that 80 percent of the summer flow of the Yakima River below Sunnyside Dam is attributable to return flow in an average year.

The April 1975 CH2M Hill report states "the most noticeable effects of farm practices are the large quantity of surface runoff with high concentrations of suspended soil particles." In addition to being a loss to the farmer, the erosion of valuable topsoil causes a number of problems. Approximately \$65,000 is spent annually cleaning sediment from the canals and drains in one drainage (Sulphur Creek) alone.

- The average suspended solids values (mg/l) for two major drains in the lower valley (Granger and Sulphur Creek) for the 1974 irrigation season were 157 and 229 mg/l, respectively. Turbidity averages were in excess of 40 JTU's in both cases for the same period.

Virtually all water quality samples taken in the basin indicate that high phosphate levels occur whenever high suspended sediment levels are present. These high levels are expected since phosphates attach to soil particles. In some areas the loss of phosphate exceeds 40 pounds per acre per year.

There has been a five-fold increase in nitrate nitrogen in the lower Yakima River in the last 20 years. A continued trend in this direction could lead to serious future problems with algal blooms.

Problems with reduction of return flow pollutants are further complicated by the high percentage of rill-irrigated ground, steep slopes, and light, erodible soils in the lower Yakima Valley. Silt loams or fine sandy loam soil types predominate in this area, making the need for irrigation practice improvement crucial.

EDUCATION AND INFORMATION PROGRAM

The education and information program is designed to enhance the effectiveness of all elements of 208 planning. Its major purpose, in concert with other program elements, is to obtain the highest possible degree of voluntary and effective participation by individual farm owners and operators in achieving water quality improvement.

The program includes a broad array of education and information activities. It utilizes many educational methods, is designed to reach a wide variety of audiences, and is intended to create program awareness, broaden public understanding, increase participation, and provide training opportunities for conservation district supervisors, district employees, and farm irrigators.

The program consists of five parts as follows:

1. Initial awareness
2. Development of program materials
3. Educational activities
4. Training activities
5. Management responsibilities

Initial Awareness

Following 208 plan approval, the two primary audiences, the general public and irrigation farmers, will be informed of the following:

A. General Public

1. Approval of the 208 plan.
2. How the plan was developed.
3. How the plan will affect the general public and irrigation farmers.
4. Designated management agency.
5. Complaint process.

B. Irrigation Farmers

1. Approval of the 208 plan.
2. When the plan is to become operational.

3. Major plan elements.
4. How plan was developed.
5. How the plan will affect irrigation farmers and farming practices.
6. How the evaluation standard was developed and the procedure for collecting samples.
7. Designated management agency.
8. Complaint process.
9. Types of technical and financial assistance available.
10. Procedure to determine the validity of a complaint.

Because of the immediate need to inform both audiences, all available mass media techniques should be utilized, in addition to personal contact through meetings, workshops, etc. This initial awareness phase should be repeated several times during the first year after plan approval, and be reemphasized at the beginning and midpoint of each new irrigation season.

Development of Program Materials

A. Gather Information

Concern about sediment in irrigation return flows is relatively new to the irrigation farming community and to the various professional people who serve the irrigation farmer. Factors affecting the amount of sediment leaving the farm and entering irrigation return flows are not completely understood. Before education and information assistance can be provided, the irrigation farmer and research-technical personnel must gather some of the following data:

Sediment data from:

1. Existing monitoring programs
2. On-farm sampling program utilizing Imhoff cones

Agronomic, engineering, and economic data from:

1. Royal Slope Research Study
2. Snake River Experiment Station, Kimberly, Idaho
3. Research personnel from private and public institutions
4. Subject matter specialists from private and public institutions

5. Literature on:

- a. Water quality sediment problems
- b. Minimum tillage, stubble mulching
- c. Irrigation water management topics
- d. Water usage studies

This education and information data-gathering activity has already started as a result of the existing sampling programs in central Washington and a research study in the Columbia Basin Irrigation Project. Efforts to collect the kind of data needed should start immediately upon plan approval. When all of the data are collected, research-technical personnel should evaluate the applicability of the information to the 208 planning areas.

This data-gathering activity should be done on a limited, continuing basis by research-technical personnel, utilizing new information obtained from the previously mentioned sources and information secured from other 208 activities, such as field demonstrations.

B. Develop Educational Materials

After the available resource information is collected and evaluated by research-technical specialists (such as agronomists, engineers, economists, irrigation water management specialists, and soil scientists), it must be conveyed to education-technical personnel via personal discussions, technical bulletins, letters, meetings, and training sessions. In some instances, the information could be used in its existing form to inform and educate education-technical personnel and irrigation farmers.

Available education-technical people represent some of the following: county (Cooperative Extension Service), state (Department of Ecology, Conservation Commission), and federal government (ASCS, SCS, FmHA); fertilizer, seed, pesticide companies; farm credit firms (local bank, PCA); commodity commissions (mint, hop, potato, fruit, etc.); crop commodity organizations, (asparagus, sugar beet, etc.); Land Grant University (Washington State University Research and Extension personnel); irrigation and conservation districts.

Educational Activities

Some of the materials developed by the research-technical personnel will be utilized directly by irrigation farmers. However, most of the information will be conveyed to the farmers by education-technical personnel and other persons normally associated with the farm community.

Information developed for the irrigation farmer will generally relate to specific items such as the evaluation standard, BMP, cost-share programs, and technical assistance. This kind of information can be presented to irrigation farmers in the form of 35mm slide sets, news articles, radio programs, bulletins, fact sheets, field demonstrations, meetings, and personal contact. Farmers will also be provided with the opportunity

for first-hand instruction in the use of such instruments as the Pitot tube, Imhoff cone, and slide rules for sprinkler and rill irrigation.

Field demonstrations will pertain to the following kinds of water quality management topics: tail-water treatment, cropping systems, irrigation systems, irrigation water management, troubleshooting, soil treatment, and water measurement devices. These field demonstrations will serve a dual role in some instances in not only showing farmers the difference between certain practices, but possibly the need for new field studies.

Although education-technical personnel associated with the management agencies will be conducting their own meetings and workshops and/or writing their own news articles, they will also be utilizing existing avenues of information dissemination in the farm community, such as the farm commodity organizations. Most of these groups hold regular meetings and publish newsletters to inform and involve their membership.

Information will be disseminated to the general public on a continuing basis after the initial awareness program phase. This will enable the public to learn how the 208 plan is progressing, problems and successes encountered by farmers, and success in reducing sediment loss in irrigation return flows. The general public will be informed on a state-wide basis through such media as news articles, and radio and television programs. On a local basis, the public will be informed by the same methods, and through local civic, social, and special interest groups.

Training Activities

A training program for personnel will, as appropriate, feature on-farm water quality management techniques and operational aspects of program management. Training will be provided for the following:

1. Conservation district supervisors
2. Conservation district employees
3. Education-technical personnel representing both private and public entities
4. Farm irrigators

Conservation district supervisors will receive training, as appropriate, in legal aspects of conservation district operation, fiscal and personnel management, and education and information programs. Conservation district employees will need to receive the same training plus training in public relations and technical operations.

Education-technical personnel will need to become knowledgeable and have an understanding of the following: definition of BMP, locally approved list of BMP, knowledge of each BMP, specific knowledge on the components of irrigation water management, irrigation scheduling, how water management can affect water quality and other crop production factors, and tillage and cultural practices affecting water quality.

The farm irrigator, whether he is the owner-operator, the operator, or an employee, will be a part of the overall training program. As an irrigator, he will need to understand BMP and the principles and practices of effective irrigation water management, including factors influencing crop yield, crop quality, sediment levels, and the economic viability of the farm. Training activities will be carried out annually to meet current needs and utilize new information.

Management Responsibilities

Education-information activities, leading or supporting agencies, and time schedules are presented in the Appendix (Table 1).

IDENTIFICATION OF PROBLEM AREAS

The primary responsibility of the local 208 management agency is to have an action program that identifies the major problem areas and encourages the voluntary adoption of BMP. By using various methods and the assistance of support agencies, the management agency will identify the most significant water quality problem areas within its jurisdictional boundaries. Within those priority areas, the agency should identify farm operators with the most significant return flow problems and contact them in an effort to avoid initiation of the complaint process.

- I. The local conservation district will review annually all water quality data, complaints, field observations, and recommendations from support agencies to determine water quality problem areas.
 - A. Irrigation districts will be consulted about sediment loading to their canals and drains and asked to rank areas by magnitude of their operation and maintenance costs.
 - B. Field observations made by conservation district and support agency personnel as part of the complaint and evaluation process will be recorded and considered in the prioritization of problem areas.
 - C. Conservation districts will review all water quality data to identify problem areas. Districts will utilize data from the following sources:
 1. Department of Ecology ambient monitoring data.
 2. U.S. Geological Survey sampling data.
 3. U.S. Bureau of Reclamation sampling data.
 4. Other water quality data that may be of value in prioritizing problems (WSU, EPA, ARS, etc.).

- D. The number, location and cause of water quality problems identified through the complaint process will be recorded and considered in the prioritization of problem areas.

II. The local conservation district with assistance from technical support agencies will annually establish priority audiences within the problem areas. The district will develop methods of contacting these individuals in an attempt to avoid initiation of the complaint process on their farm units. Such methods may include the following:

- A. Consult with irrigation districts for location of possible significant sediment contributors.
- B. Check discharges in priority areas against the local evaluation standard (where applicable).
- C. Contact farmers with potential sediment problems and ask for their participation in the local 208 program by:
 - 1. Personal letter.
 - 2. Personal contact by conservation district representative.
 - 3. Other audience - specific education, information, or awareness methods.

Summary

Each program year, outputs from the above activities will be projected as follows:

- 1. Types of on-farm problems to be addressed. (annually)
- 2. Geographic areas to be worked in. (annually)
- 3. Individuals with the most significant water quality problems to be addressed. (quarterly)
- 4. Methods used to contact possible water quality problem operators. (annually)
- 5. Estimates of voluntary action on-farm to clean up sediment return flow problems. (quarterly)

Table 2 in the Appendix identifies the agencies assigned specific responsibilities for problem identification and program operation.

IMPLEMENTATION PROCEDURE

The implementation procedure presented below describes a series of actions by which water quality problems identified through a complaint process or

by farmers seeking assistance can be evaluated and resolved (see Figure 5). As explained previously, the local program is voluntary. The optional regulatory program is administered by the Department of Ecology only at the request of the conservation district and following consultation about actions taken.

"Local Program"

Complaint

The proposed implementation plan relies upon citizen or agency complaints to identify farmers who are not meeting the goals and objectives of the 208 program. Any citizen who observes a potential violation can file a complaint by phone or in person with the local conservation or irrigation district office.

Upon receipt of a complaint, personnel in the irrigation or conservation district office will record the necessary information on a standard form. Required information will include the following:

- a. Name and address of person filing the complaint.
- b. Nature of the complaint.
- c. Location, time, and date of observation.

After recording the complaint, whichever district received it (conservation or irrigation) will notify the other district, plus the farmer involved. The conservation district will inform the farmer about the nature of the complaint and his alternatives. He will also be asked to be present when an evaluation is made to determine if the complaint is valid.

Self-Initiated Action

Farmers who have water quality problems, and who desire technical and financial assistance for designing and installing "best management practices" (BMP), can initiate action on their own by requesting aid from the conservation district. Following an on-site investigation and confirmation of a valid problem, these farmers would be eligible for assistance in the same manner as those who become involved through the complaint process.

Evaluation

Evaluation of the complaint will be conducted by a representative from the irrigation district, the conservation district, and the farmer. The purpose of the investigation is to gather two types of information: (1) a measurement of the concentration of settleable solids lost in the return flow, and (2) data concerning the cause and source of the problem, including soil, crop, slope, amount of water applied, and presence or absence of "BMP."

208 IMPLEMENTATION PLAN

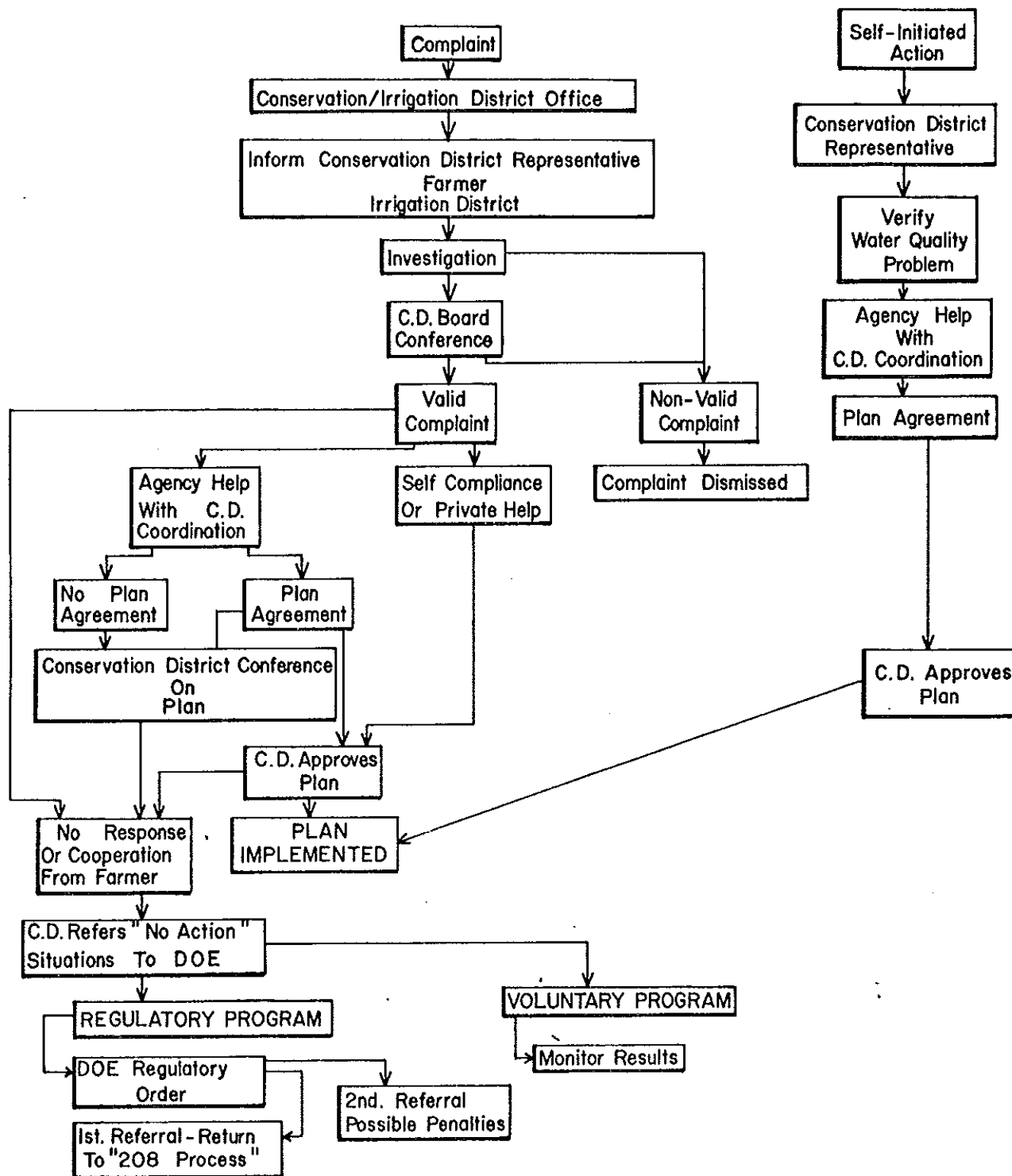


FIGURE 5

The settleable solids concentration will be measured at the lower end of the farmer's property where it leaves his control. The concentration will be compared with an evaluation standard set by the local water quality committees (see page 30). The standard represents what the farmers judge to be an acceptable increase in settleable solids above that received at the headgate.

The data concerning the cause and source of the problem will be presented to the conservation district when it meets to make a final decision on the validity of the complaint.

Decision

The evaluation standard will serve primarily as a preliminary means to dismiss invalid complaints without involving the conservation district in a detailed analysis of every complaint filed. If the concentration in the return flow does not exceed the standard, the conservation district representative will notify the district and the complaint will be dismissed as invalid. However, if the concentration exceeds the standard, the conservation district will thoroughly examine the situation using the other data collected during the evaluation.

The district will try to determine the cause of the problem, possible solutions, and whether it is within the economic capability of the farmer to correct it. If the conservation district feels that the necessary corrective measures are not economically feasible, or that the problem is due to unusual circumstances beyond the farmer's control, the complaint will be dismissed as invalid, regardless of whether or not the standard is met. On the other hand, if the district feels that the farmer can do a better job of protecting water quality, the complaint will be declared valid and corrective measures may be necessary.

Compliance

Conservation districts have the option of choosing either a voluntary or a regulatory program. If a voluntary program is chosen, it must be a well-structured program carried out at the local level with adequate resources to insure its effectiveness. The program must contain measures to evaluate its success in applying BMP and to determine the effectiveness of BMP in improving water quality.

Following verification of a water quality problem, the farmer will have three alternatives to correct his problem. His first option would be to implement BMP on his own without agency assistance. If the conservation district approves these measures as being sufficient to correct the problem, the farmer will be in compliance with the goals and objectives of the 208 program, when the BMP are implemented.

As the second option, the farmer can meet with the conservation district to discuss development of a farm plan. The district will make available to the farmer technical assistance and cost-share funds, if available, to enable him to design and implement BMP. Specific BMP to be implemented

on the farm will be determined jointly on a case-by-case basis by the farmer and the district. The plan will also contain a time schedule for implementation of the BMP.

Completion of a farm plan and acceptance of its requirements will be strictly voluntary on the part of the farmer. When the plan is approved by the district and accepted by the farmer, he will be in compliance with the 208 program as long as the requirements of the plan are followed. The district will also have the power to alter conditions of the plan, if requested by the farmer for specific reasons.

The third option available to the farmer may involve regulatory action. At this stage in the process the conservation district may ask DOE to require individual farmers to clean up their water quality problem.

"Optional Regulatory Program"

If all efforts to achieve voluntary compliance by the farmer under the "Local Program" part of the implementation plan fail, the conservation district will decide if regulatory action should be requested. The district will continue to work with the farmer as long as progress is being made. If the district feels that progress is no longer possible, it can notify DOE and request the department to take action to require compliance.

The DOE will enforce state water quality laws in support of local programs when requested to do so by the conservation district, and when the Director feels such action is warranted by the merits of the case. Department action will initially take the form of a regulatory order which will require the farmer to again meet with the conservation district and complete a conservation plan. If the farmer still fails to reach an acceptable agreement, the department will consult with the district before taking further action.

The department will pursue legal action against an individual who is in violation of a departmental order.

If the department does not feel the case merits regulatory action, or if the department's authority to act is questionable, the case will be recorded as unresolved. If it becomes apparent that the department's existing authority is not sufficient to resolve irrigation return flow water quality problems, the need for other regulatory sanctions will be assessed and brought to the Washington State Legislature for clarification.

ANTICIPATED OUTPUTS

Anticipated outputs resulting from implementation of the water quality management plan are listed in Table 1, along with the expected dates of completion.

Table 1

Anticipated Outputs	Year					
	1978	1979	1980	1981	1982	1983
1. Expansion of conservation district membership (if necessary).	●	—	●			
2. Hiring of conservation district personnel.	●	—	●			
3. Completion and signing of Management Agency Implementation Statements (MAIS).	●	●				
4. Identification of priority areas.	●	●	●	●	●	●
5. Implementation of information/education program.	●	—	—	—	—	—
6. Submission of applications for RCWP funds.	●	—	●			
7. Commitment of technical resources.	●	—	—	—	—	—
8. Commitment of manpower resources.	●	—	—	—	—	—
9. Completion of Farm Plan Agreements.		●	—	—	—	—
10. Adoption of BMP by farmers.		●	—	—	—	—
11. Documentation of complaints filed.		●	—	—	—	—
12. Documentation of regulatory actions taken.		●	—	—	—	—
13. Annual assessment and submission of annual reports.			●	●	●	●
14. Implementation of special monitoring studies.		●	—	●		
15. Assessment of program success.				●	—	●

PROCEDURE FOR REVISING BMP AND PLAN ELEMENTS

Procedures for revising Best Management Practices (BMP) will be undertaken as the need arises. Potential BMP are included in the water quality management plan as guidelines to assist farmers in developing solutions to their water quality problems. The list of management practices included in the handbook is open-ended, and can be added to or changed at any time. When the local conservation district feels that a new practice is both locally acceptable and economically feasible, the district can add the practice to the list of BMP. Similarly, old practices can be removed from the list by an action of the local conservation district.

Procedures for revising other elements of the implementation plan will be more involved. Minor changes in operating agreements between agencies can be handled by the agencies renegotiating their memorandums of agreement. Major changes affecting goals and objectives of the plan, regulatory actions, implementation schedules, and milestones can only be changed after a public review process.

Requests for major changes can be initiated by any of the parties responsible for implementation of the water quality management plan. Requested changes will be submitted to the Department of Ecology for action. The department will evaluate the requested action in terms of its anticipated impact on meeting future water quality goals.

The Continuing Planning Process is a document describing the institutional arrangements by which the state, working cooperatively with other agencies, will make water quality management decisions involving local governments. The document establishes the procedure for incorporating these decisions into a statewide water quality management plan. Major revisions to the plan described in this document will conform to the requirements of the Continuing Planning Process and will be subject to the same public participation requirements as the original plan.

Requests found to be consistent with meeting the goals and objectives of 208 planning will be taken through a public review process. Comments will be sought both at the local level through contacts with conservation districts and other local farmers and through public hearings held throughout irrigated areas. Final action to amend the 208 plan will be taken following consideration of all public comment on the proposed changes.

PROGRAM EVALUATION AND DIRECTION

The conservation district will provide direction and guidance in workload allocation. Work plans will be completed by each cooperating agency and reviewed by the conservation district for adequacy in the following program areas:

1. Education-information
2. Program operation

3. Program evaluation and direction.

This work plan review will be completed one month prior to the beginning of each program year.

DOE will meet with the conservation districts and Conservation Commission representatives to provide direction and guidance concerning the annual evaluation. Data from the Imhoff cone monitoring program, intensive surveys, and fixed station monitoring will be provided to the districts to assist them in identifying problem areas and to determine trends in water quality improvement.

Each year, the conservation district will evaluate the water quality program for direction, balance, and effectiveness, (i.e., Is the program reaching the problem sites and implementing solutions? Are the practices applied effective in improving water quality?). A report of the program evaluation will be made during the first quarter of each calendar year to the following agencies: Department of Ecology, Conservation Commission, Cooperative Extension Service, Soil Conservation Service, irrigation districts, and other support agencies. The evaluation will include, but not be limited to, the following:

1. Completion and implementation of the Water Quality Management Plan (first year only).
2. First-year activities of gearing up the management and support agencies.
3. Identification of problem areas and priority audiences addressed.
4. Anticipated outputs completed.
5. Success in meeting anticipated annual goals.
6. Efforts expended in providing on-farm technical and financial assistance.
7. Documentation of BMP installed on problem farms.
8. Documentation of success of voluntary vs. nonvoluntary program.
9. Assessment of water quality data and trends in water quality improvement.

Program evaluation activities and the responsible agencies are identified in the Appendix, Table 3.

ANNUAL GOALS

Individual management agencies each year will establish anticipated goals as part of their annual program plans. The annual plans will provide a schedule and estimate of the extent of the water quality problem that

can be expected to be controlled each year. Annual goals will not be established with strict numerical standards, but will be kept flexible to fit changing conditions. Factors such as resources available to the management agency, changing market conditions, and technical developments will affect the attainment and establishment of program goals.

Annual goals will be established to identify farmers with water quality problems and to encourage installation of BMP on their farms. Potential water quality problems will be identified by the evaluation standard. Data collected during the summer of 1978 will allow an estimation of the number of farmers expected to exceed the standard.

Observations of water quality problems throughout the irrigated areas and analysis of the sampling data has shown that the majority of irrigation farmers are already using BMP and do not have a water quality problem. The extent of water quality problems within the planning areas is defined as the number of farmers whose return flows exceed the evaluation standard. The annual program goal for the management agencies will be to bring a fixed percentage of these farmers into compliance with the standard.

Numerical goals cannot be set for percentage reductions in pollutants generated, acreage treated, or water quality standards met. However, the goal can identify an estimated number of farmers (or farm units) to be involved in the 208 program each year.

EVALUATION STANDARD DEVELOPMENT

Background

Initial efforts by water quality committees to develop BMP indicated a need for a standard to identify farmers with a water quality problem. The committees felt the water quality management plan should apply to all farmers, but should be designed to affect only those with a serious problem. They felt some criterion was needed to determine if a complaint were valid, since this would be the mechanism by which many farmers become involved in the 208 process.

The water quality committees decided that the most practical measure of soil loss was the parameter of settleable solids as measured in an Imhoff cone. Although it would not be representative of the total amount of sediment leaving the farm, the committees felt that the advantages of simplicity and speed were more important. The committees requested that DOE establish a program to develop an evaluation standard which could be used to objectively identify problem farms. The standard was to have the following two characteristics:

1. It should be established by the water quality committees to meet local conditions.
2. It should be easy to understand and use. Farmers would be able to determine on their own if they were in compliance with the standard.

To gather the necessary data base the committees asked DOE to provide Imhoff cones to individual farmers for use in collecting samples. Approximately 150 cones were distributed throughout the Yakima and Columbia basins during the summer of 1977. Data was to be recorded on forms supplied by DOE.

The initial program had some problems. The cones were not distributed until the middle of July (because of delay in shipment) and consequently, the peak sediment discharges were not sampled. Similarly, this delay caused the program to miss the peak in farmer enthusiasm.

The water quality committees felt that there was not enough data gathered the first year to be usable. They asked the DOE to design a program for the following year to correct the first year's problems. In August, personnel from DOE and the Conservation Commission began to design a sampling program for the 1978 irrigation season in the Yakima and Columbia basins.

Several proposals were presented to the 208 staff and the Irrigated Agriculture Technical Advisory Committee. After numerous meetings and discussions involving the 208 staff, the Technical Advisory Committee, and several statisticians from WSU, the water quality committees agreed upon the following objectives and restriction:

Objectives

1. The sampling program should be designed to statistically show the range, median, and average levels of sediment in return flows leaving irrigated farms.
2. The sampling program should allow the collection of additional data desired by the WQCs.
3. The sampling program should provide an opportunity for irrigation farmers to be involved in the process of setting the performance standard.
4. The sampling program should be designed so the data could be used to gauge the effectiveness of a nonregulatory or regulatory implementation program in the future.

Restriction

1. The sampling program cannot be designed to statistically relate farm management practices to the sediment level in any given return flow.

Program Operation

Selection of Sites: There were two methods of selecting sampling sites. The first (a) satisfied the above objectives 1, 2, and 3. The second method (b) satisfied objectives 1, 2, and 4.

- (a) Public notification of the sampling program was made through meetings, workshops, newsletters, and advertisements. As with the 208 program itself, the key to the success of this portion of the sampling program was public participation. To encourage the public to participate, DOE printed a brochure explaining the program and its purpose. The brochure was distributed to the public at workshops and meetings. Additionally, the brochure was attached to monthly newsletters and also mailed out to people on existing mailing lists. Included with the brochure was a self-addressed form that could be mailed back by those interested in participating in the program. On the back of the sampling brochure was a contact list so farmers interested or involved in the program could exchange information by making a local phone call.

DOE requested the cooperation of the WSU Cooperative Extension Service, SCS and irrigation districts in encouraging farmer participation in the sampling program.

A list of voluntary participants and necessary background information was prepared. Farmers who wished to participate in the sampling program were contacted by the local WQC's or DOE before the irrigation season started. At that time, background information necessary to conduct the sampling program when the irrigation season began was obtained. This information included:

- a. Amount of land irrigated.
- b. Location of the farm.
- c. What crops would be grown.
- d. Approximately when the irrigation would start.

By obtaining this information prior to the irrigation season, it was possible to prepare a three-month sampling schedule that would help determine when and where the sampling should be done.

- (b) The five counties involved in the program were mapped, with irrigation districts and larger drainages outlined. Farms were selected randomly from the drainages or blocks within the irrigation districts.

To make the selections, lists of water users and their locations were obtained from the irrigation districts. Approximately 10 to 15 percent of the water users from each irrigation district were selected. After selection, the farmers were contacted by the DOE and asked to participate. If they did not wish to participate or did not have a discharge, the next closest farm was contacted until the percentage desired was obtained.

Sampling Procedure

DOE published a standard sampling procedure and data sheet. The procedure covered the use of all the equipment, plus how to evaluate the sampling unit for the information required on the data sheet.

The following information was collected from each unit sampled and recorded on the standard data sheet for future reference:

- a. Quality of inflow (in ml/l of settleable solids).
- b. Quality of outflow (in ml/l settleable solids).
- c. Number of irrigations - 1st, 2nd, 3rd, etc.
- d. Other information required by the WQCs and/or the irrigation specialist.

All units were sampled in the following manner:

Several samples were taken at random throughout the irrigation season. The sampling schedule was flexible enough so units could be added or omitted as the need arose. The data collected was returned to the DOE Central Regional Office in Yakima throughout the summer. DOE staff then analyzed the data, made any needed adjustments in the sampling program, and reported the results to the WQC's and other agencies involved.

MANAGEMENT PRACTICES

The water quality committees have identified 25 practices which can be used by irrigation farmers to improve water quality. The practices were reviewed and approved by the 208 Irrigated Agriculture Technical Advisory Committee. A management practices handbook (see page A-27) which describes each practice will be available to local management agencies and farmers. The handbook will be used only as a guideline to illustrate possible solutions to water quality problems.

The following potential Best Management Practices are explained in the handbook. The list is open-ended, allowing for changes in technology to be included as they become feasible. The handbook is to be used, not as a list of mandatory practices, but as a guideline from which one or more practices can be selected for inclusion in an approved farm plan or farm management agreement specifically designed to solve water quality problems on an individual farm. Individual practices do not become BMP until they have gone through the 208 implementation process outlined on page 24.

IRRIGATION SYSTEMS

- Land Leveling
- Lined Ditches
- Siphon Tubes
- Buried Pipe with Water Control Valves
- Handlines
- Side-Role Wheel Lines
- Center Pivot Systems
- Solid Set Systems
- Drip (Trickle) Systems
- Modified Drip Systems
- Portable or Dual Systems

IRRIGATION WATER MANAGEMENT

- Constant Rate Flow
- Fixed Time
- Cutback Irrigation
- Modified Flow
- Pressed (Slick) Furrows

TAILWATER MANAGEMENT

- Turn-back Flows
- Mulching
- Drop Structures
- Buried Pipe
- Vegetative Strips
- Sediment Basins
- Reuse Systems

SOIL MANAGEMENT

- Reduced Tillage
- Residue Management

BMP were defined by the Technical Advisory Committee as "agronomic, management, or structural practices that, when used singly or in combination with other practices as a component of an approved farm plan, address the minimum, essential treatment needed to solve site-specific water quality problems." The factors of economic feasibility, local acceptance, and effectiveness in improving water quality will be addressed by the management agency in the process of designating individual BMP.

FARM MANAGEMENT AGREEMENT

Existing Soil Conservation Service Farm Management Agreements (FMA) will be the principal vehicle to implement BMP on problem farm units. Individual farmers may install BMP on their own, but those who desire technical or financial assistance will be required to complete an FMA.

Contents of a typical FMA (or Conservation Contract) include the following:

1. Inventory and evaluation of on-farm
 - a. Identified water quality problems.
 - b. Existing soil and water management practices.
2. Map showing delineation of soils within the problem sites or units, including a soil description and interpretation upon which to base land use and treatment decisions.
3. Map showing problem site locations, present or anticipated land use, access routes, and location of water delivery points and return flow discharges.

4. Identification of alternative BMP specific for problem sites.
5. Summary of needs, both technical and financial, required by the farmer to implement BMP.
6. Contents of cooperative agreement which describes the services the district will provide ~~or~~ arrange, and the practices the farmer agrees to implement.
7. Certification by:
 - a. Owner/operator that time schedule and BMP will be adhered to unless unforeseen circumstances require revision.
 - b. Conservation district that the time schedule and BMP are a reasonable solution to the water quality problem.
 - c. Conservation district that follow-up will be done to provide necessary assistance and to insure that the agreement is followed.
8. Documentation (file copy only):
 - a. Planner's notes.
 - b. Results of investigation(s).
 - c. Follow-up notes, etc.

MANAGEMENT AGENCY IMPLEMENTATION STATEMENT (MAIS)

Individual MAIS for each conservation district designated as a management agency will be prepared and signed prior to the 1979 irrigation season. (See page A-23 for a sample copy of an MAIS.)

INCENTIVE PROGRAMS

Throughout the planning process, the farming community has requested flexible and realistic incentive programs to aid in implementation of BMP. The types of programs most often mentioned were cost-sharing and tax credit programs.

Rural Clean Water Program

Included in P.L. 95-217, the Clean Water Act of 1977, is a new federal cost-sharing program designed to encourage implementation of BMP. Section 35 of the law authorized 600 million dollars for this purpose. The program has been titled the Rural Clean Water Program (RCWP).

No RCWP cost-share funds were authorized for expenditure by Congress during the 1979 fiscal year.

Referendum 26

In 1972 the Washington State Legislature authorized the issuance and sale of state general obligation bonds in the sum of \$225,000,000. The purpose of the referendum was to provide funds to public bodies for the acquisition, construction, and improvement of public waste disposal facilities. Of the total authorized bond issue, \$10,000,000 was administratively designated for agricultural pollution control.

DOE is examining administrative policies and procedures to identify projects eligible for Referendum 26 agricultural pollution control funds. Consistent with the limitations of state law, the department will encourage the use of Referendum 26 funds to assist farmers and other eligible applicants who may require financial assistance to comply with local water quality management plans.

Small Watershed Program

Another possible source of cost-share funds to assist farmers in implementing BMP may be the Small Watershed Program (P.L. 83-566) administered by the Soil Conservation Service. Emphasis of the program has been shifted from structural flood control measures to land treatment.

SECTION III

PUBLIC PARTICIPATION

PUBLIC PARTICIPATION

Statement of Strategy

Section 101(e) of P.L. 95-217 requires that public participation must be provided for, assisted, and encouraged in the development of 208 water quality management plans. The purpose of public participation is to build broad citizen and legislative support for the overall water quality management effort.

The irrigated agriculture 208 work plan outlined a broad-based and extensive public participation effort during the two-year planning process. Major emphasis was placed on identifying affected publics, organizations, and influence groups and actively seeking their ideas and recommendations.

Section 208 is a water quality law and best management practices must be developed to meet the clean water objectives of federal law. The necessity to develop BMP as a primary component of the 208 plan placed certain constraints on the planning process. It was imperative that farmers with practical experience in using the practices should designate the BMP, which have to meet the three criteria of being locally acceptable, economically achievable, and effective in improving water quality.

Public participation by farmers and other interested persons was sought throughout the entire planning process. The operating philosophy behind the program was that the public would advise the department on how to best meet the desired goal. DOE would provide the necessary guidance and resources to complete the effort.

Targeted Publics

Public participation activities within the irrigated planning program targeted farm audiences and organizations. Initial contacts during the fall of 1976 were made with local irrigation and conservation districts since these were the groups most likely to be active in the planning process. Conservation district involvement was prompted by a resolution passed at the 1976 Washington Association of Conservation Districts convention which made the following recommendations:

1. That the Conservation Commission ask DOE to assist local district boards in creating an awareness among land occupiers of the authority given to them by DOE to initiate 208 planning within their districts.
2. That this assistance be in the form of materials suitable for use in the media, and for informational programs in the various conservation districts.
3. That the timing of these informational programs be coordinated with local district efforts.

As a result of this resolution, DOE and the Conservation Commission decided to utilize conservation districts as the primary mechanism to secure public participation. Districts within each county in the irrigated areas were asked to form water quality committees to provide input during the two-year planning process on development of BMP and implementation plans.

The water quality committees were formed around the nucleus of existing district membership, but with an expanded representation to include other elements of the farm community. Invitations were sent out by district boards to representatives of farm organizations, commodity groups, and irrigation districts asking them to participate in water quality committee meetings.

Membership on each water quality committee was kept flexible, with different groups and organizations participating at various times. Notice of upcoming meetings was sent to all interested persons, and was handled by each conservation district, or in some cases by DOE personnel. Meetings were held periodically throughout the winter months, but were generally suspended during spring and summer when farmers were too busy to attend. The meetings were commonly held at the local SCS office within each district, or at other convenient locations.

All major irrigation districts were kept informed of progress during the planning effort. Irrigation district support for the 208 program was considered crucial, since the districts are managed by local farmers and are responsible for water delivery and collection systems. Members of the major irrigation district boards of directors were members of water quality committees, and the district managers were invited to attend committee meetings.

Irrigation districts were also expected to play a role in implementation, since they maintain the water supply system. Participation by the irrigation districts would help to ensure fast and efficient identification of problems and, hopefully, lead to faster solutions. Irrigation and conservation districts held several joint meetings to identify the implementation responsibilities of each, and to prepare the necessary memorandums of understanding under which they would operate.

Farm organizations and grower and commodity groups participated in the planning process, primarily through representatives on the water quality committees. Organizations such as the Farm Bureau, Grange, and Cattlemen's Association actively participated in the water quality committee and other 208 meetings. Grower and major crop commodity groups also participated.

Staff Responsibilities

Department of Ecology

The DOE, as lead agency for irrigated agriculture 208 planning had joint responsibility with the Conservation Commission for completion of the nine public participation tasks listed in the work plan. DOE committed

the efforts of the following six personnel to the public participation element:

1 Environmentalist IV (Headquarters)	- 18%
1 Environmentalist II (Headquarters)	- 20%
1 Environmentalist III (Eastern Region)	- 9%
2 Environ. Trainees (Central Region)	- 25%
1 Comm. Affairs Analyst (Headquarters)	- 35%
1 Comm. Affairs Consultant (Headquarters)	- 4%

DOE was responsible for designing a coordinated public information program and the necessary materials, and in cooperation with the Conservation Commission, insuring that it was carried out. Newsletters, radio spots, brochures, and newspaper and magazine advertisements were prepared by DOE staff. Television and radio announcements were prepared under contract by Washington State University and KWSU Radio and TV.

DOE was also responsible for scheduling water quality committee, basin work group, and other similar meetings to obtain local input into the planning process. Meetings and speaking engagements with irrigation and conservation districts, farm organizations, and the general public were encouraged wherever possible.

Washington State University

A contract was signed between Washington State University and the Conservation Commission for informational and educational materials and professional staff assistance by Extension Service personnel. Washington State University had the following specific responsibilities:

1. Cooperate with the Conservation Commission in the planning and implementation of off-campus educational, informational, and public involvement programs.
2. Prepare educational materials appropriate to planning and implementation of Section 208.
3. Provide professional staff assistance to conduct educational programs, publish information, and insure public input.
4. Commit the Cooperative Extension Service to one man-year of effort to assist DOE and the water quality committees in public participation efforts.

Conservation Commission

A contract was signed between the Conservation Commission and the DOE committing the Commission to assist in completing a number of tasks in the irrigated agriculture work plan. The Commission was to assume partial responsibility for completion of the following public participation tasks:

1. Design an information/education program to be implemented by the Conservation Commission and DOE.

2. Create specific public awareness methods to be used with local groups and organizations.
3. Establish and maintain working relationships with conservation districts.
4. Inform the "key influence group" representing those counties not included in the Columbia and Yakima basins.
5. Conduct periodic informational meetings with the basin work groups.
6. Prepare and issue press releases.
7. Implement a public awareness program and coordinate with 208 developments.

The Commission committed the efforts of the following three people to the Public Participation element:

1 Irrigation Specialist (Yakima)	- 36%
1 Irrigation Coordinator (Olympia)	- 5%
1 Secretary	- 16%

Conservation Commission efforts were concentrated primarily on working with local conservation districts and water quality committees. Emphasis was on encouraging attendance at local 208 meetings, keeping conservation districts informed and involved, and developing BMP.

Summary of Public Participation Activities

Meetings

The public participation strategy for irrigated agriculture was to enlist through various methods, the input of the irrigation farming community. The 208 public participation effort emphasized meetings and workshops among agency people, local farmers, and agricultural organization representatives. To a lesser extent, the public participation effort also included a statewide awareness and information program.

Water quality committee meetings were held primarily in the winter months when local farmers were better able to attend. The eight committees held an average of a dozen or more meetings apiece during the two-year planning process.

Representatives from the water quality committees in each basin met periodically as a basin work group to review local proposals and policy questions in an attempt to formulate a uniform plan. It was felt that the plan would be more effective and acceptable if each conservation district were to follow similar procedures. Four such meetings were held in each basin.

In January 1978, at about the midpoint of the planning process, DOE sponsored a series of 13 workshops throughout the Columbia and Yakima

basins. The workshops were designed to acquaint the general public and farmers not previously involved in the planning process with the draft implementation proposal developed by the water quality committees. A total of 551 citizens (390 farmers) attended the workshops. Also attending were state legislators, county commissioners, and many agency people.

With one exception, the workshops were all chaired by a local water quality committee member. This technique helped the public identify the 208 effort as being a local program, and encouraged their participation in the discussion groups. At the end of each workshop a poll was taken to see how many of those attending approved or disapproved of the draft implementation proposal. The majority of those voting supported the plan as presented at the meeting.

Three legislative hearings were held during the planning period to inform legislators about the proposed plan and allow the public an opportunity to express their views. Most farmers urged a cautious approach to 208 planning and stressed the need for local control.

Planning efforts were also discussed at numerous other meetings involving irrigation farmers. These meetings included presentations at conservation district's area association meetings and annual convention, special meetings between water quality committees and irrigation district boards of directors, informational meetings with SCS and Extension Service personnel, and agricultural field days and tours.

Materials Produced

Informational materials produced for distribution included news releases, feature articles, brochures, posters, and a newsletter.

Eleven articles and/or news releases about various aspects of 208 planning were distributed during the planning process. Eight different brochures and pamphlets were distributed to water quality committees, conservation and irrigation districts, and the general public.

Seven issues of DOE's newsletter Waterline were mailed to a general audience throughout the state. Contents of the newsletter included articles on the Department of Ecology's programs in both water quality and water resources.

Other materials distributed included slide rules for irrigation scheduling, (enabling a farmer to calculate the correct amount water to apply to his furrows), weirs to measure flow in the furrow, and Imhoff cones to measure the concentration of settleable solids in the return flow.

Television and radio spots were produced periodically throughout the planning process. In January 1978, spots were released to six television stations and 16 radio stations throughout the irrigated areas to announce the workshops.

DOE also contracted with the League of Women Voters to assist with public information activities for the workshops. The League utilized the efforts of its members residing in the small towns and rural areas throughout the Yakima and Columbia basins.

Public Hearings

The final public participation activity of the planning process was a series of four public hearings to receive input on the draft plan prior to submittal to the Governor for certification. Three hearings were held in the 208 planning areas (Yakima, Pasco, and Moses Lake) and one in Seattle.

Testimony and/or written statements were received from eleven persons during the public hearings. Comments that specifically addressed the water quality management plan included the following:

1. Concern about the future role of water quality committees.

Many water quality committee members have expressed a desire for a continuing role in an advisory capacity to the conservation districts, Soil Conservation Service, and DOE.

DOE recognizes the valuable role played by committee members in preparing the water quality management plan. A new statement was added to the Recommendations section that reads as follows:

"Water quality committees should continue to serve in an advisory capacity to conservation districts, the Department of Ecology, and the Soil Conservation Service regarding implementation of the 208 plan."

2. Concern about the definition of "best management practices" (BMP).

Several comments addressed the definition of BMP contained in the plan.

This definition was written and approved by the Irrigated Agriculture Technical Advisory Committee. DOE feels the definition should remain as written. The concerns raised should be answered by the requirement for BMP to be economically feasible, locally acceptable, and effective in improving water quality.

Concerns about experimental BMP and additions or deletions to the list of management practices are answered in the plan. The list of practices is open-ended and can be changed at any time. Any practice can be designated a BMP if agreed to by the management agency and the farmer involved.

3. Questions about the reference to a three-to-five year time period to allow a voluntary implementation program an opportunity to demonstrate success.

Several comments addressed the reference to a specific time period during which DOE would assess the success of the 208 program (Recommendation 11 in the Summary section). The most consistent concern expressed was that the three-to-five year period was too short given the limited availability of resources to implement the plan.

The specific time period is not meant to imply that a rigid time schedule will be followed. The water quality committees felt that three-to-five years was a reasonable period to determine if the program is workable and acceptable to the farming public. The wording "at least" before "three-to-five years" implies that this would be the minimum time period acceptable.

4. Questions about the role that EPA will play in plan approval.

Several comments addressed a statement in the plan which implies that EPA must approve the plan after adoption by the state and certification by the Governor.

EPA has approval authority over individual elements of the statewide water quality management plan.

5. Concern about economic costs.

Several comments addressed the economic costs to farmers who must apply BMP. Lack of adequate cost-share money was a major concern.

DOE and the water quality committees recognized that economic costs would occur, and included safeguards in the implementation procedure to protect farmers. These include: (1) BMP must meet the definition of being economically feasible; (2) BMP will be determined jointly on a case-by-case basis by the farmer and conservation district members; (3) BMP may be implemented over a period of time through completion of a Farm Management Agreement; and (4) Cost-share funds will be made available, wherever possible.

6. Various other comments were submitted that applied more to the initial 208 planning requirement than the plan itself. These comments will be considered by DOE when evaluating future 208 planning efforts and updating the current 208 plan.

SECTION IV

ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL ASSESSMENT

Environmental Protection Agency regulations require the preparation of an "environmental assessment" which describes the impact of adopting a proposed water quality management plan (WQM). To meet this requirement, an analysis was prepared that addresses the following six major points:

1. Description of the existing environment without the implementation of the WQM plan alternatives.
2. Description of the future environment without the implementation of the WQM plan alternatives.
3. Evaluation of alternative elements of the plan.
4. Environmental impacts of the proposed implementation of the WQM plan.
5. Steps to minimize any adverse impacts.
6. Constraints impacting achievement of plan objectives.

The analysis that follows is not a typical assessment on the effect of a specific proposed action on the environment. The "action" to be taken is the adoption of a set of administrative procedures that will lead to the resolution of water quality problems. As a result, the commonly used outline for an assessment of a facility plan or construction grant has been altered.

Much of the information commonly contained in an environmental assessment will be found scattered throughout various sections of the proposed WQM plan. This section will attempt to pull together a broad overview of the effect of the entire plan, without repeating the detailed information contained elsewhere.

Description of the Existing Environment without Implementation of the WQM Plan Alternatives.

Columbia Basin

Information on the water quality of surface waters within the Columbia Basin is relatively scarce. A review of what information is available is contained in the Water Resources portion of this document.

Surface waters in the basin, under existing conditions, are generally of poor quality compared to other areas of the state. Water quality standards are generally Class B, indicating some beneficial uses are impaired. The standards for turbidity, bacteria, and pH are the most often violated. In addition, high nutrient levels in Moses Lake frequently result in noxious blooms of blue-green algae during the summer months. Nonpoint source pollutants, including those from irrigation return flows, are believed responsible for many of these water quality problems. In addition, natural causes are believed to be a contributing factor to poor water quality in many areas.

Under existing conditions, water quality within the basin is highly variable from one area to another and even from farm to farm. Most irrigated land within the planning area is part of the Columbia Basin Irrigation Project of the Bureau of Reclamation. Development of project lands was done by irrigation block, which is a number of farm units served by a common water distribution system. The quality of return flows leaving individual blocks can be highly variable, depending on the soils, slopes, and general topography of the area. More recently developed blocks normally have a high percentage of land irrigated by sprinkler and thus have cleaner return flows than do areas developed years ago.

Return flow water quality may also be highly variable from farm to farm. Farmers who are concerned about soil conservation can usually overcome the water quality problems inherent to a poor site by utilizing specific techniques such as water management or by building structural controls such as sediment ponds.

At the present time, farmers have no special incentive to concern themselves about water quality. Efforts to promote soil conservation techniques by the SCS, ASCS, and local conservation districts have resulted in some improvement in water quality. In most cases, however, emphasis has been placed on protecting the soil resource and/or increasing productivity. The proposed WQM plan will be the first major effort in most areas of the basin to actively promote improved water quality, with the exception of some local programs implemented by individual irrigation districts.

Current water quality problems in the basin typically result from runoff of tailwater from heavily cultivated row crops on steep slopes. Probably the biggest factor aggravating this situation is the high cost of labor. As farms grow larger, and labor costs increase, farmers are increasingly reluctant or unable to commit large amounts of manpower to managing irrigation water. As a result, water management techniques that could control runoff are not used, and water quality problems increase.

A further negative factor in the last several years has been the depressed level of farm prices. Many farmers have not been able to make the necessary investments in new equipment, labor, or structures that would allow them to improve the quality of their return flows.

Yakima Basin

Information on the quality of surface waters within the Yakima Basin is more plentiful than in the Columbia Basin. Most surface waters in the lower basin are of poor quality and classified as Class B under the existing water quality standards. The standards for turbidity and bacteria are the most often violated. Nutrient levels in the lower Yakima River frequently meet or exceed the threshold for algal blooms during the summer months.

As in the Columbia Basin, water quality in the Yakima Basin is highly variable from one area to another, and from farm to farm. Most irrigated land within the planning area is part of the Bureau of Reclamation's

Yakima Project, which was originally developed to provide water for rill irrigation. Return flow quality within the basin varies with the topography and crops, and is highly dependent on whether the individual farmer has converted from rill to sprinkler irrigation in recent years.

Description of the Future Environment without Implementation of the WQM Plan Alternatives

Columbia Basin

Future environmental impacts without implementation of the WQM plan would be similar to existing conditions in those parts of the planning area that are currently being irrigated. Most of the available land is already being farmed, and the new land being brought into production is almost exclusively being sprinkler irrigated. As a result, water quality within the existing irrigated areas should not get any worse.

The long-term trend would probably be for some slight improvement in water quality due to a gradual transition to sprinkler irrigation. In addition, efforts by conservation districts, the SCS, and the ASCS will result in some improvement in water quality as soil conservation measures are implemented in future years.

Factors working against this long-term trend include the rapidly rising cost of power to run sprinklers, increasing labor costs, and increasing farm size. Two other factors which could work in either direction are changes in farm income and changes in crop patterns throughout the basin. Trends toward fewer row crops, for example, would result in improved water quality.

The impact of future irrigation development resulting from completion of the Second Bacon Siphon and Tunnel could result in increased sediment loading to the Columbia River. The quality of runoff from the newly irrigated lands should be cleaner than that from existing irrigated areas due to the fact that most new development will involve sprinkler irrigation. As a result, the quality of some surface waters such as Crab Creek, Esquatzel Coulee, and Lind Coulee may even increase due to a diluting effect from an increased supply of wastewater. However, the greatly increased volume of flow expected will probably result in a greater total quantity of sediment transported from the area.

Drainage water from the Columbia Basin Project consists of direct surface runoff and ground water return flow. Estimates for the amount of water diversion in the Columbia Basin for the level of development expected in the year 2020 were made by Hanlon (1973) ^{1/} as follows:

^{1/} Hanlon, Douglas. Columbia Basin Project Return Flow Study. 1970 and 2020 levels of development. Bonneville Power Administration. April, 1973.

.3 AF/A	operational waste
.4 AF/A	farm runoff
1.1 AF/a	canal and lateral loss (includes evaporation)
1.7 AF/A	ground water return flow
2.25 AF/A	consumptive use
5.75 AF/A	total

Information from this study indicated that drainage totalling about 2.9 AF/A (2.5 AF/A underground return flow +.4 AF/A farm runoff) can be expected upon completion of the Columbia Basin Project. Major increases in flow by the year 2020 are expected for the Esquatzel Coulee system (1,000 percent increase) and for the Potholes Canal (500 percent increase). Much of the increased Potholes Canal water could be discharged into lower Crab Creek by way of a spillway structure at O'Sullivan Dam (Hanlon, op. cit.).

The much larger volumes of water returning to the Columbia River from the irrigation project will result in increased loading of most major pollutants including sediment, turbidity, bacteria, nutrients, and salts. Conversely, the quality of the wastewater itself may be cleaner than it is now due to the effects of dilution.

Future irrigation development within the project area will produce return flows of a different quality than that now found in the basin. Turbidity and sediment levels should be less and the associated phosphorus, pesticides, and bacteria levels should be reduced.

Improved water management practices made possible by the widespread use of sprinklers should result in reduced nitrate losses. However, improved irrigation efficiency could result in an increase in salinity within the soil profile. If it should become necessary to flush these salts from the soil profile, there could be an increase in the concentration of Na, Ca, Mg, and K salts in the return flows from the project area.

Yakima Basin

Average annual diversions within the Yakima Basin total about 2,500,000 acre-feet for the irrigation of approximately 544,000 acres. There are no plans to significantly increase this diversion in the near future. The use of 'dead' storage water from reservoirs or the planned increase in size of reservoirs, such as Bumping Lake, may or may not affect the quality and quantity of return flows. If the increased water supply were to increase the number of currently irrigated acres the quality of return flows could be worse if the trend toward development of steep land on the fringes of the project continues. New land tends to be brought in under sprinkler irrigation, which could lessen the impact, but this is by no means a hard and fast rule in the Yakima Basin.

Evaluation of Alternative Elements of the Plan

The extensive public participation process that resulted in preparation of the draft WQM plan included the identification and rejection of many

alternative proposals. As a result, the proposal presented in this document represents just one alternative, the others having been previously rejected.

During the planning process, a number of alternatives to the ones presented in this document were considered. The most significant of these, and the reason for their rejection is explained below.

1. Source of Complaints

The primary alternative to the procedure included in the draft plan would be for the Department of Ecology, an irrigation district, or a conservation district to conduct a systematic monitoring and surveillance program throughout the irrigated areas. The purpose of such a program would be to identify violators of the local evaluation standard.

This alternative was rejected by the local water quality committees for two reasons. Foremost in their minds was a desire to preserve local control and to avoid building up a large bureaucracy. Secondly, return flow violations may be difficult to document due to the interruptible nature of the discharge and the presence of other mitigating factors. As a result, the committees decided to rely on complaints from local farmers to identify possible water quality violations.

2. Lead Agency

The Management Agency Implementation Statement (MAIS) for the draft plan will identify the local conservation district as the lead agency responsible for directing implementation of the plan elements. Two alternatives were considered by the water quality committees. One alternative was for the local irrigation district to serve as the lead agency. This was rejected primarily because the irrigation districts felt that it was outside the scope of their jurisdiction to implement the necessary plan elements. In addition, the irrigation districts were not eligible to receive the financial and manpower resources necessary to implement the plan.

The other alternative (considered by the Columbia Basin water quality committees only) was to form an independent governmental unit called the "Big Bend Clean Water Authority" (BBCWA). The authority would be based on drainage basin boundaries and would encompass all of the Columbia Basin Irrigation Project. All counties, cities, towns, and other municipal corporations, irrigation districts, conservation districts, and other interested governmental agencies would participate in its development and operation.

The BBCWA would be chartered primarily to coordinate on a regional basis all water quality activities within the basin boundaries. Specific duties would include the following:

- a. Administer NPDES and state waste discharge permits.

- b. Conduct water quality investigations.
- c. Assimilate water quality and waste discharge data.
- d. Identify and coordinate water quality enforcement actions with existing agencies.
- e. Coordinate and implement the 208 WQM plan for the Columbia Basin.

The feasibility of creating the BBCWA and making it work is unknown. Enabling legislation would be necessary, both to create the authority and to transfer responsibilities from other agencies to it. Because it would cover such a broad range of activities, it would probably take several years to create the authority and make it operational.

The alternative of creating a BBCWA was rejected by the water quality committees because they felt it would remove local control of 208 implementation, and because of a desire not to create a new governmental agency.

3. Role of Best Management Practices (BMP)

When 208 WQM planning began, the Department of Ecology approached the water quality committees with a description of BMP that implied their use in a regulatory manner. The first series of committee meetings within each conservation district area was devoted to drawing up a list of BMP and defining their use. The unanimous recommendation of all water quality committees was that BMP should be used only as guidelines to educate farmers about possible corrective measures that might be taken. The practices were not to be mandatory for any single farmer, and were only to apply to farmers who had a serious water quality problem. This recommendation was ultimately adopted as the basis for a definition of BMP that was approved by the Irrigated Agriculture Technical Advisory Committee (ITAC).

4. Role of Evaluation Standard

The decision by the water quality committees to recommend BMP only as guidelines necessitated the development of an evaluation standard to identify problem farmers. Initial discussions about the standard revolved around how it would be established, how reliable it would be, and how it would be used. The water quality committees considered the alternative of establishing the standard as a regulation which could be enforced. This alternative was rejected for several reasons, including a desire not to require such a strict regulatory program, and because of lack of confidence in the reliability of the standard to accurately identify violations.

5. Agency to Perform Regulatory Actions

The draft WQM plan identifies DOE as the agency to perform regulatory actions when requested by the local conservation district. Alternatives considered included giving regulatory authority to conservation districts, irrigation districts, and county government. The alternatives were rejected because of a desire not to have to seek new legislative authority, which would be necessary if these agencies were to be given regulatory power. Also, there was a reluctance among many of the farmers to become involved in any kind of regulatory action against their neighbors. The county government alternative was rejected because of a general feeling that enforcement of water quality laws would be given such a low priority as to be ineffective.

Environmental Impacts of the Proposed Implementation of the WQM Plan.

Environmental impacts of the proposed plan will result in improved quality of irrigation return flows throughout the project area, and progress toward meeting the 1983 goal of fishable-swimmable waters. At the present time, it is impossible to determine whether this goal will be met following implementation of the plan.

The impact of the plan in existing irrigated areas will have two expected results on the water resources of the area. The most significant impact will be a reduced loss of sediment, pesticides, nutrients, and bacteria in return flows. A secondary impact will result from the more efficient use of water by irrigation farmers. Conversion of surface irrigated land to sprinkler irrigation, and adoption of improved water management techniques as a BMP will result in reduced flows of wastewater leaving the existing irrigated areas.

The WQM plan's impact on irrigated land to be brought into production in future years is difficult to determine. Ideally, the new lands to be developed from the Second Bacon Siphon and Tunnel in the Columbia Basin will profit from mistakes learned in other irrigated areas. The primary impact of the plan will probably be to focus attention on water quality concerns as the project is designed and developed. The result should be return flows of a higher quality than those found in existing irrigated areas, and more efficient use of the water resources that are available.

Other expected environmental impacts will fall into two main areas. Implementation of the draft plan will probably result in encouraging farmers to change to sprinkler irrigation at a faster rate than would be expected without the plan. The result will be an increase in the demand for electrical power to run the sprinklers and to pressurize the supply systems.

The other expected environmental impact may fall in the area of wildlife habitat reduction in the existing irrigated areas. The present irrigation system in much of the planning area was established to supply water for surface irrigation methods. The wastewater from these lands is collected in a series of ditches, drains, and wasteways for removal from

the area. If the WQM plan results in an increased rate of conversion to sprinkler irrigation, there will be a reduction in the number of surface collection systems, which in many areas provide wildlife cover. Conversion to sprinklers also usually results in larger fields, and a reduction in wildlife cover along fence rows.

Steps to Minimize any Adverse Effects

Expected adverse effects resulting from implementation of the WQM plan could come in the following four areas:

1. Reduced wildlife habitat (as explained above)
2. Increased power demands (as explained above)
3. Economic impacts on farmers
4. Possible salinity buildup due to more efficient irrigation water use.

Steps to minimize adverse impacts on wildlife habitat and electric power supply have not been addressed.

Methods to minimize adverse economic impacts on farmers are included in the implementation element of the plan. Mitigative measures include providing cost-share funds, where available, to assist farmers in implementing BMP, utilizing the Farm Management Agreement concept to provide farmers with a long-term approach to solving their water quality problems, and relying on the judgment of other local farmers to determine if a BMP is economically feasible and locally acceptable for a particular farm.

Measures to prevent salinity buildup in future years throughout the planning areas have not been addressed. At present, this is not a serious problem except in rare, localized instances. If the problem should increase in the future, preventive measures can be developed to resolve it.

Constraints Impacting Achievement of Plan Objectives

Achievement of the goals and objectives outlined in the WQM plan will be dependent on a wide range of variables. The plan was prepared to meet the water quality needs of Washington's irrigated areas, and yet remain acceptable to local farmers and achievable with the limited resources available. The following discussion identifies the various factors which will impact the success of the plan.

1. Farm Prices

The economic health of individual farmers may be the greatest contributing factor determining the success or failure of the WQM plan. When crop and livestock prices are high enough to allow farmers to make a profit, they will be more able and willing to invest in conservation practices. Conversely, when prices are depressed, the

requirement that BMP be economically feasible may allow many water quality problems to remain uncorrected.

Forecasts of long-term farm prices, and therefore the capability of farmers to adopt BMP, are highly unpredictable. The probable pattern of BMP implementation will be one of considerable variation from year-to-year depending on the prevailing farm prices.

2. Awareness and/or Concern About Water Quality Problems

A second factor affecting farmer's willingness to adopt BMP is the level of awareness and/or concern about the water quality problems caused by irrigation return flows. After two years of planning effort, the level of awareness among irrigation farmers is reasonably high. The WQM plan outlines an information/education program to be implemented by the conservation district, SCS, and Extension Service to keep the farming public aware of the program and the reasons for it. The success of the information/education effort in raising the level of concern among farmers will be a major factor affecting the success of the program.

3. Availability of Financial and Technical Resources

The conservation district Management Agency Implementation Statements will list the manpower and financial resources available to the various involved agencies. The resources available are limited, and are probably at the minimum level which could be expected to meet the desired goals and objectives.

The greatest resource need is for trained personnel who can work with the individual districts to provide technical assistance, identify problems, and perform the necessary administrative duties. Three such positions have been proposed for funding in the irrigated areas of the state. One will be located in the Yakima Basin and two in the Columbia Basin.

The positions will be funded through individual conservation districts, with the employee responsible directly to that district. He will be available to work for other districts in the basin through operating agreements completed between them and the management district.

Other resources, such as funding for information/education specialists and to finance training programs, are also very limited. At this time, it cannot be determined whether the funds available will be adequate to do the job.

4. Availability of Financial Incentives

The availability of financial incentives to assist farmers in implementing BMP will influence the success of the program. Current ACP cost-share programs will continue to be available to farmers, but all BMP may not be eligible under the program. When Congress passed the Clean Water Act, it included an amendment to Section 208 which

provides for cost-share funds to be given to farmers in support of BMP. The success of this federal program will depend upon how well it is funded by Congress, and on the restrictions placed upon use of the funds. No funds were authorized for expenditure during the 1979 fiscal year.

DOE has examined the feasibility of utilizing other types of financial incentives, including Referendum 26 funds and tax incentives. However, neither appears to be immediately feasible for assisting individual farmers to implement BMP.

5. Reliance on Voluntary Compliance

The implementation procedure outlined in the WQM plan relies primarily on voluntary compliance by local farmers. All of the water quality committees felt the plan would be more acceptable if the voluntary aspects were emphasized.

The plan does contain procedures for regulatory action by DOE, but this would be called for by the conservation district only after all other attempts at voluntary compliance had failed. If farmers are unwilling to comply voluntarily, or if the districts are unwilling to call for regulatory action, the lack of an enforcement element could affect achievement of the plan objectives. DOE, however, took the position that the voluntary elements of the program would be given every opportunity to work before a decision would be made on whether to seek more regulatory authority.

6. Reliance on a Complaint Process

The WQM plan outlines a complaint process as the primary means by which water quality problems will be identified. The water quality committees did not want a surveillance program to be established, either by the conservation districts or by state agencies. Reliance on a complaint procedure will probably mean that fewer problems will be found than under a surveillance program.

7. Effectiveness of Management Practices

The effectiveness of the management practices implemented by local farmers will influence achievement of plan objectives. Cause and effect relationships between specific practices and their effectiveness in improving water quality are poorly understood. As a result, it is not known to what degree the list of management practices developed by the water quality committees will result in improving the quality of return flows.

Currently, an irrigation water quality study is being conducted by Washington State University in the Columbia Basin Project near Othello. Outputs from this study will help to identify cause and effect water quality relationships and the economic effectiveness of various practices.

APPENDIX

AGENCY RESPONSIBILITIES

Individual Management Agency Implementation Statements (MAIS) will be completed by each conservation district involved in implementation of the water quality management plan. The MAIS will include agency responsibilities, a schedule for major actions, and will outline financial and other needed resources.

Management agency designation will place the legal burden and responsibility for plan implementation at the local level. Conservation districts will complete operating agreements with other agencies to provide resources not otherwise available.

The following outline lists the expected major responsibilities of each agency:

Conservation Districts

1. Assist in identification of priority water quality problem areas.
2. Coordinate allocation of workload among cooperating agencies, and complete necessary operating agreements.
3. Process water quality complaints using the implementation procedure outlined in the 208 plan.
4. Identify BMP for problem farms, and approve Farm Plan Agreements for those farms.
5. Assist in implementation of an information/education program for irrigation farmers.

Soil Conservation Service

1. Provide on-farm water quality planning assistance to farmers.
2. Provide technical assistance required for installation of BMP.
3. Assist the conservation district in identifying priority audiences and implementing an information/education program.

Cooperative Extension Service

1. Develop and assist the conservation district in implementing an information/education program.
2. Provide technical assistance and recommendations to solve water quality problems.

3. Assist in monitoring and evaluating the conservation district's effectiveness as a management agency.

Agricultural Stabilization and Conservation Service

The ASCS will assist in financing the adoption of BMP through existing agricultural cost-share programs and/or the Rural Clean Water Program.

Farmers Home Administration

The FmHA will support implementation of the water quality management plan by making loans available to farmers to finance certain soil and water conservation practices as specified under current law.

Department of Ecology

1. Assist in identification of priority water quality problem areas.
2. Provide the conservation district with water quality data and conduct a water quality sampling program to measure the success of the 208 effort.
3. Serve as a contact agency between EPA and local 208 program agencies.
4. Insure that the 208 program is implemented successfully by taking regulatory action at the director's discretion when requested by the local conservation district.
5. Seek cost-share funds under provisions of the Rural Clean Water Program and other sources.
6. Coordinate annual program review.

Conservation Commission

1. Provide training for conservation district supervisors, district employees, and technical personnel.
2. Assist in development of public information materials for use by the conservation districts.
3. Coordinate activities between individual districts to assist implementation of the water quality management plan.
4. Coordinate monitoring and evaluation of the conservation district's effectiveness as a management agency.

Irrigation Districts

1. Assist in identification of priority problem areas.
2. Assist in making a preliminary complaint investigation.
3. Participate in training programs for conservation district supervisors and employees.
4. Assist the conservation district in information/education activities concerning water quality problems.

Table 1. Management Responsibilities - Education-Information Program

Activity	Responsible Party*									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
A. Initial information awareness program										
1. Inform general public										
a. 208 plan approval	X	X			<u>X</u>	X			X	Monthly during 1st quarter following approval.
b. Designated management agencies	X	X			X	X			<u>X</u>	Monthly during 1st quarter following approval, plus prior to and during each irrigation season.
c. Complaint process		X			X	X			X	Monthly during 1st quarter following approval, plus prior to and during each irrigation season.
2. Inform irrigation farmers										
a. 208 plan approval	X	X			X	X		X	<u>X</u>	Monthly during 1st quarter following approval.
b. Designated management agencies		X			X	X		X	<u>X</u>	Monthly during 1st quarter following approval, plus prior to and during each irrigation season.

*SCS - Soil Conservation Service
 CES - Cooperative Extension Service
 FmHA - Farmers Home Administration
 ASCS - Agricultural Stabilization and Conservation Service
 DOE - Department of Ecology

MA - Management Agency
 WSU - Washington State University
 ID - Irrigation District
 CC - Conservation Commission

NOTE: Agencies assigned significant responsibilities are designated by X. Lead agencies are shown by X.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party*									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
c. Sediment performance standard	X	X			X	X		X	<u>X</u>	Monthly during 1st quarter following approval, plus prior to and during each irrigation season.
d. Kind of technical and financial assistance available	X	X	X	X	X	X	X	X	<u>X</u>	Monthly during 1st quarter following approval, plus prior to and during each irrigation season.
e. Local approved list of BMP	X	X				X		X	<u>X</u>	Monthly during 1st quarter following approval, plus prior to and during each irrigation season.
f. Role of BMP in 208 complaint process, farm plan, etc.	X	X			X	X		X	<u>X</u>	Monthly during 1st quarter following approval, plus prior to and during each irrigation season.
g. Complaint process		X			X	X		X	<u>X</u>	Monthly during 1st quarter following approval, plus prior to and during each irrigation season.
B. Develop information on the following to disseminate to appropriate audiences:										
1. Sediment data from:										
a. Ambient monitoring program*					X		X	X	<u>X</u>	1st quarter of each year.
b. On-farm random sampling method					<u>X</u>	X		X	<u>X</u>	1st quarter of each year.
c. On-farm sediment level determination	X	X			X	<u>X</u>		X	<u>X</u>	When requested by farmer or when deemed necessary by MA ID.

*The Bureau of Reclamation and U.S. Geological Survey have extensive ambient monitoring programs and are additional sources of water quality data.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
2. Agronomic, engineering, economic data from:										
a. Research plots and studies	X	X				X	X		<u>X</u>	Within 6 months of plan approval and yearly thereafter.
b. Demonstration plots	X	X				<u>X</u>	X		<u>X</u>	Within 6 months of plan approval and yearly thereafter.
c. Literature	X	X				<u>X</u>	X		<u>X</u>	Within 6 months of plan approval and yearly thereafter.
C. Develop news articles, featured articles, and advertisements										
1. Statewide type: General content										
a. 208 program direction	X	X			X		X		X	First two months after plan approval.
b. Legislative direction	X	X			<u>X</u>				<u>X</u>	First six months after plan approval.
c. Subject matter	X	X			X		X		<u>X</u>	Yearly during 1st quarter.
d. Notice of public hearings	X	X			X		X		<u>X</u>	As needed.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
2. Local area type: general or specific content										
a. Notice of local meeting						<u>X</u>				Prior to each meeting.
b. Tour schedule	X	X				<u>X</u>		X		Prior to each tour.
c. Recommended practices to reduce sediment problem	X	X				<u>X</u>	X	X		Monthly or week as opportunities area available (local option).
d. Results from demonstration and research plots	X	<u>X</u>				X	X			Monthly or weekly as opportunities are available (local option).
3. Develop general program and subject matter material to be used by local technical and management agency personnel in a variety of educational methods	X	X			X	X	X		<u>X</u>	Within 6 months of plan approval and thereafter during winter months.
D. Audio visual										
1. Develop slide sets on 208 program, BMP, and related topics	X	X			X	X	X		X	Photo - during irrigation season and slide set development during winter months.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
2. Develop video tapes on specific subject matter items and where movement is necessary to illustrate subject to audiences		X			X	X	X		<u>X</u>	Photo - during irrigation season and slide set development during winter months.
3. Develop materials and presentations which could be utilized on television for various purposes	X	X			X	X	X		X	As opportunity presents itself.
4. Publications										
a. Develop new newsletters or utilize existing newsletters of agencies and organizations	X	X	X	X	X	X	X	X	X	Where void exists or opportunities exist.
b. Develop bulletins to inform farmers of research results, recommended practices, etc.		<u>X</u>					X			Immediately with existing information and when new information is available.
c. Develop handbooks as convenient reference material for farmers and technical personnel.	X	X					X		X	Immediately with existing information and when new information is available.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
d. Develop pamphlets, fact sheets, and brochures to inform farmers and public of general and specific subjects	X	X	X	X	X	X	X		X	Immediately with existing information and when new information is available.
5. Develop radio presentations on various subjects and utilize existing farm radio programs	X	X			X	X	X	X	X	Immediately with existing information and when new information is available.
6. Develop display(s) for commodity conferences	X	X			X		X		X	Prior to winter meeting season beginning early fall of each year.
7. Secure available instruments for farmers which will assist in improving water quality	X	X			X	X	X	X	X	Prior to irrigation season.
E. Establish demonstration plots to show kind and value of locally accepted BMP and/or to gather agronomic water quality data.										
1. Tailwater treatment	X	X				X	X			Planning - 1st quarter each year establishing irrigation season.
2. Cropping systems	X	X				X	X			Planning - 1st quarter each year establishing irrigation season.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
3. Irrigation system	X	<u>X</u>				X	X			Planning - 1st quarter each year establishing irrigation season.
4. Irrigation water management	X	<u>X</u>				X	X			Planning - 1st quarter each year establishing irrigation season.
5. Soil treatments	X	<u>X</u>				X	X			Planning - 1st quarter each year establishing irrigation season.
6. Trouble-shooting - on-farm demonstration, no plot involvement	<u>X</u>	X				X				When requested by farmer, MA, etc.
7. Water measurements and water quality instruments (tensiometers, Stevens recorder, furrow weir)	X	<u>X</u>			X	X	X			Prior to and during irrigation season.
F. Meetings to inform different kinds of audiences about different aspects of the 208 project areas										
1. General public, civic groups, etc.										
a. General aspects of 208 project areas and their relationship to entire 208 program	X	X			X	<u>X</u>	X		X	During 1st year when opportunities are created.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
b. Progress of 208 effort	X	X	X	X	X	<u>X</u>	X		X	During 1st year when opportunities are created and on yearly basis.
2. Irrigated farmers in 208 project areas										
a. All technical and financial aspects of 208 program	X	X	X	X	X	<u>X</u>	X		X	Monthly during 1st six months and a minimum of two meeting per year thereafter.
3. Commodity groups, fieldmen, farm credit firms										
a. Water quality relationships to crops, fertilizers, pesticides, fixed and variable production costs	X	<u>X</u>			X	X	X		<u>X</u>	Monthly or when meetings normally occur.
G. Training programs for:										
1. Conservation district supervisors										
a. Legal aspects of conservation district									<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
b. Financial									<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.
c. Personnel management	X	X					X		<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.
d. Education and information										
(1) Short and long term program planning	X	X					X		<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.
(2) Memorandums of understanding	X	X							<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.
(3) Public meetings		X					X		<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.
2. Conservation district managers										
a. Training as indicated for district supervisors	X	X					X		<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
b. Public relations							X		<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.
c. 208 program subject matter	X	X	X	X	X		X	X	<u>X</u>	1st quarter after plan approval and review on yearly basis thereafter.
3. Technical personnel from private and public organizations										
a. Definition of BMP	X	X	X	X	X		X	X	<u>X</u>	During first six months and on continuing basis.
b. List of developed and approved BMP	X	X	X	X	X		X	X	<u>X</u>	During first six months and on continuing basis.
c. Knowledge and understanding of BMP handbook	X	X	X	X	X	X	X		<u>X</u>	During first six months and on continuing basis.
d. Knowledge and understanding of the components of irrigation water management										
(1) Soils	X	X				X	X		<u>X</u>	Intensive training schedule first year, and yearly thereafter.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
(2) Crops	X	X				X	X		<u>X</u>	Intensive training schedule first year, and yearly thereafter.
(3) Climate	X	X				X	X		<u>X</u>	Intensive training schedule first year, and yearly thereafter.
(4) Irrigation systems	X	X				X	X		<u>X</u>	Intensive training schedule first year, and yearly thereafter.
e. Irrigation scheduling	X	X				X	X		<u>X</u>	Intensive training schedule first year, and yearly thereafter.
f. How improved and/or poor water management can affect other crop production factors	X	X				X	X		<u>X</u>	Intensive training schedule first year, and yearly thereafter.
g. Tillage equipment usage and their effects on soil structure compaction and residue placement	X	X				X	X		<u>X</u>	Intensive training schedule first year, and yearly thereafter.
h. Cultural practices affecting water quality, sediments, and other crop production practices	X	X				X	X		<u>X</u>	Intensive training schedule first year, and yearly thereafter.

Table 1. Management Responsibilities - Education-Information Program (Continued)

Activity	Responsible Party									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
4. Farm irrigators										
a. Understanding of BMP's	X	X				X	X		<u>X</u>	During first year of program and on continuing basis with winter and summer sessions.
b. Knowledge and understanding of the components of irrigation water management	X	X				X	X		<u>X</u>	During first year of program and on continuing basis with winter and summer sessions.
c. Understanding of how their effectiveness will influence crop yield, crop quality, the farm unit meeting, the sediment performance standard, and the economic viability of the farm unit	X	X				X	X		<u>X</u>	During first year of program and on continuing basis with winter and summer sessions.

Table 2. Management Responsibilities - Program Operations

Activity	Responsible Party*									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
A. Identify priority areas:										
1. Consult with irrigation district on major problem areas.						<u>X</u>				1st quarter of each program year.
2. Field observations.	X	X			X	<u>X</u>		X		Year long.
3. Review all water quality data collected.	X	X			X	<u>X</u>	X		X	1st quarter of each program year.
B. Identify priority sites										
1. Consult with irrigation district on significant sediment contributors.	X					<u>X</u>		X		1st quarter of program year.
2. Check all discharges against "sediment standard."						X		X		Year long during irrigation season.
3. Contact all operators with a sediment problem.	X					<u>X</u>		X		Year long.
C. Prepare an Annual Plan of Work for the Water Quality Program.	X	X			X	<u>X</u>			X	1 month prior to end of program year.

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CES - Cooperative Extension Service

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ASCS - Agricultural Stabilization and Conservation Service

DOE - Department of Ecology

MA - Management Agency

WSU - Washington State University

ID - Irrigation District

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NOTE: Agencies assigned significant responsibilities are designated by X. Lead agencies are shown by X.

Table 2. Management Responsibilities - Program Operations

Activity	Responsible Party*									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
D. Coordinate allocation of workload:										Continuous during program year.
1. Education - Information Program	X	X				X			<u>X</u>	
2. Operation procedures	X	X				X			<u>X</u>	
3. Program evaluation.	X	X	X	X	X	X		X	<u>X</u>	
E. Operation of field program:										
1. On farm problem identification.	<u>X</u>	X				X				Year long.
2. Recommend problem solutions.	<u>X</u>	X				X				Same as above.
3. Develop farm management agreement.	<u>X</u>					X				Same as above.
4. Provide technical assistance on design and installation of BMP.	<u>X</u>					X				Same as above.
5. Plan review and referral for cost share allocations.						<u>X</u>				Same as above.
6. Allocation of incentive funds.	X		X	X		X			X	Same as above.
7. Plan certification for water quality program.						<u>X</u>				Same as above.

Table 2. Management Responsibilities - Program Operations

Activity	Responsible Party*									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
8. Follow-up on time schedule compliance, revision, etc.	X					<u>X</u>				Same as above.
F. Complaint process operation:										
1. Receipt of complaint.						X		X		During irrigation season.
2. Notify cooperating agencies.						X		X		Within 2 hours of receipt of complaint.
3. Preliminary check of complaint.						X		<u>X</u>		As soon as practical following notification.
4. Investigation scheduling with parties involved.						<u>X</u>				Within 8 hours of initial receipt of complaint.
5. Investigation.						<u>X</u>		X		Within 24 hours of receipt of complaint.
6. Report on complaint to management agency.						X		X		As soon as needed to begin action by MA on servicing complaint.
7. Document results of complaint, investigation, etc.						<u>X</u>				To be completed as each item is completed in complaint process.
8. Provide technical assistance	<u>X</u>	X				X				As soon as available.

Table 3. Management Responsibilities - Program Evaluation

Activity	Responsible Party*									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
A. Assess conservation district effectiveness in coordination of:										End of each program year - report due 30 days after end of P.Y.
1. Technical support agencies' assistance in priority areas.	X	X	X	X	X	X	X	X	<u>X</u>	
2. Technical support agencies' assistance to conservation district.	X	X	X	X	X	X	X	X	<u>X</u>	
3. Providing financial assistance to implement BMP.	X		X	X		X			<u>X</u>	
4. Implementation of the Education/Information Program.	X	X			X	X			<u>X</u>	
B. Assess progress in providing on-farm assistance.										30 days prior to end on program year.
1. Farm plans implemented.	X					<u>X</u>				
2. Farm plans in progress.	X					<u>X</u>				

*SCS - Soil Conservation Service

CES - Cooperative Extension Service

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ASCS - Agricultural Stabilization and Conservation Service

DOE - Department of Ecology

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WSU - Washington State University

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NOTE: Agencies assigned significant responsibilities are designated by X. Lead agencies are shown by X.

Table 3. Management Responsibilities - Program Evaluation

Activity	Responsible Party*									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
3. On-farm evaluations.										30 days prior to end of program year.
a. In progress.	X	X				<u>X</u>				
b. Completed.	X	X				<u>X</u>				
4. BMP installed.										
a. With technical assistance.	X					<u>X</u>				
b. Voluntarily - resulting from awareness program.	X	X				<u>X</u>				
c. Resulting from complaint process.	X	X				<u>X</u>				
5. Technical assistance.	X	X				<u>X</u>				
C. Financial assistance.										
1. Financial assistance.			X	X		<u>X</u>				
2. Dollars spent.										
a. Administrative costs.			X	X		<u>X</u>				
b. Dollars spent on BMP.	X		X	X		<u>X</u>				

Table 3. Management Responsibilities - Program Evaluation

Activity	Responsible Party*									Time of Activity
	SCS	CES	FmHA	ASCS	DOE	MA	WSU	ID	CC	
D. Irrigation farmer involvement in 208.										30 days prior to end of program year.
1. Resulting from education-information efforts.										
a. Indirect contacts.	X	X				<u>X</u>				
b. Direct contacts.	X	X				<u>X</u>				
c. Other.	X	X				<u>X</u>				
* 2. Resulting from conservation district selection of priority sites.										
a. Number selected and how contacted.						<u>X</u>				
b. Number of plans completed.	X	X				<u>X</u>				
c. Number of noncooperating farmers.	X	X				<u>X</u>				
* 3. Resulting from complaint system.										
a. Number of complaints made.						<u>X</u>		X		
b. Types of complaints.										

3. Coordinate allocation of workload among cooperating agencies.
4. Process water quality complaints using the procedure outlined in the 208 plan.
5. Identify BMP and approve farm plans for individual farms.
6. Supervise activities of district employees within their jurisdictional area.

C. Project Evaluation

1. Establish a tracking procedure to facilitate evaluation of program elements.
2. Provide information and data requested by the Conservation Commission to facilitate an annual assessment of the districts's effectiveness as a management agency.
3. Assess progress in providing on-farm technical and financial assistance.
4. Evaluate the effectiveness of BMP and make revisions as necessary.
5. Prepare an annual report summarizing results of the above evaluations.

Schedule for Major Agency Actions

See Water Quality Management Plan appendix, Tables 1, 2, and 3.

Legal Authority

The _____ Conservation District can carry out its 208 responsibilities under the provisions of Chapter 89.08 RCW without additional legal authority.

Funding Support

The Conservation Commission will provide funding to support _____ Conservation District employee positions in the _____ County planning area. Manpower allocation to individual districts will be dependent on prioritization of problem areas. The _____ Conservation District will fulfill the above implementation responsibilities to the extent that manpower and other necessary resources allow. Funding and resource requirements to meet district responsibilities are presented in the attached budget.

Agreement Life

The functional life of this agreement shall run from the date of signing through June 30, 1980. At that time, the agreement will be open to amendment.

Acceptance of Responsibility

Within _____ County, the _____ Conservation District will be the designated management agency. This district will have the additional responsibility of disbursing funds received from the Commission, and of coordinating and managing the activities of district employees within the county. The _____ Conservation District agrees to conduct its management responsibilities as described above within the framework of 208 manpower and budgetary agreements established with the designated management agency in _____ County.

The _____ Conservation District has approved the 208 water quality management plan. Upon receipt of funds to cover the needs identified in the attached budget, the Board of Supervisors will proceed to assume all responsibilities delegated to the district as management agency.

ACCEPTANCE STATEMENT

This is to certify that the _____ Conservation District will accept the responsibility for implementing the _____ County Irrigated Water Quality Management Plan to the level of funding that is made available for this activity.

_____, Chairman

_____, Secretary

_____ Conservation District
By resolution of the Board of Supervisors on this ____ day of _____ 1979.

We the undersigned Conservation Districts of _____ County do
accept, endorse, and will support _____ Conservation District
as the Designated 208 Management Agency for _____ County.

_____, Chairman
_____ Conservation District on this ____ day of _____ 1979

_____, Chairman
_____ Conservation District on this ____ day of _____ 1979

_____, Chairman
_____ Conservation District on this ____ day of _____ 1979

_____, Chairman
_____ Conservation District on this ____ day of _____ 1979

_____, Chairman
_____ Conservation District on this ____ day of _____ 1979

Management Practices Handbook

This document is currently being printed and will be available in February 1979.

